Managing interactions in the e-learning environment : Technological support for academic staff.

ISLAM, N.

Managing interactions in the e-learning environment: technological support for academic staff

ISLAM.N Ph.D. 2015

Acknowledgements

In the name of Allah, The Most Gracious, The Most Merciful.

All praise and thanks to Allah, the lord of the worlds for giving me the ability and patience to accomplish this study.

My gratitude goes to Dr. Martin Beer and Dr. Frances Slack for guiding me throughout the research process and making things easy wherever possible. I also like to thank Dr. Abdulai AbuKari and all those academics who participated in the interviews.

Contents

List of Tables

List of figures

Abstract

Over the last two decades the use of e-learning technology increased to such an extent that the role of the traditional academic has been forced to change. Focusing on academics' views, this study examines their interactions in the e-learning environment and whether online learning applications have increased academic workload (Eynon, 2005; Olaniran, 2006). This study also identifies how their role has changed and the underlying factors which may cause negativity in their working environment. This understanding then generated the theory behind a prototype application, produced to be an addition to the current tools that academics use, with the intention to reduce academic efforts in creating content for teaching.

Based on literature review, twelve interviews with academics and analysis of participant transaction logs suggests that online learning applications have increased workload. For some academics the use of e-learning technology in UK higher education can be a full time occupation. It is evident from the data that the drawbacks to current e-learning technology outweigh the number of benefits. A key concern is the high number of hours which are being spent on e-learning systems by academics. This research states unequivocally that the level of complexity for some academics is daunting, as well as frustrating. This study argues that managing expectations of academic staff is vital to the success of e-learning systems.

A web-based prototype application was developed to extend the current functionality of e-learning systems, with a key objective to decrease the time spent by academics on e-learning activities; functionality which has not yet been incorporated by other e-learning platforms such as Blackboard or Moodle. The prototype was tested by three academics who agreed that their overall experience was positive, effective and beneficial. Most importantly, they believed that the application would reduce the number of hours they spent on e-learning activities.

Chapter 1 Introduction

1.1 Background to the research

Throughout history, mankind always had a high regard for learning and devised technology to deliver knowledge to the new generations. Traditional methods of learning usually required a teacher, textbook and writing board when various kinds of teachers and religious scholars delivered knowledge by holding lectures and seminars (Huddlestone and Pike, 2008).

However, with the advent of computer technology many changes have arisen in teaching styles and methods. During the last fifteen years, computer based learning has emerged as the innovative delivery method for education (Moos and Azevedo, 2009). In some instances Internet based education has taken the place of traditional classroom learning (Zhang et al., 2004; Huddlestone and Pike, 2008; Wang and Wang, 2009; Hardaker and Singh, 2011; Macharia and Pelser, 2012).

Historically, the slate board was invented during the 17th century in the United Kingdom (UK) a cost effective alternative to pen and paper. It allowed students to make notes for learning and the technology was re-usable and efficient. The slate board focused on individual learning whilst the teacher was solely responsible for giving clear instructions, this kept the teacher dominant and class control was at its peak (Roberts, Leung, and Lins, 2013).

In the early 18th century the blackboard appeared, allowing teachers to write notes to assist student learning, this also allowed larger classes of students. The teacher gained more prominence in presenting instructions whilst the student note taking reduced in comparison to the slate board period (Kidwell, Ackerberg-Hastings, and Roberts, 2008).

In early 1980s Computer Based Training (CBT) software was introduced, this was primarily designed for computing professionals to learn how to use computers. The late 80s and early 1990s saw the CD ROM become popular which allowed CBT courses to be easily stored, transportable and a cheaper alternative to instructor class room based training (Cross, 2004). Other technologies such as the ballpoint pen, whiteboard and the overhead projector (OHP) were created to serve the purpose of delivering knowledge. These instruments have become the norm.

Whilst technology advanced, the last two decades have seen the rise of UK higher education institutions taking advantage of these technologies to facilitate distance learning education using whatever tools available to support learning. Two example institutions stand out the University of London1 and the Open University2.

Distance learning has been offered at The University of London since 1858; with communication and delivery being achieved via postal services in the early years. Since then their student numbers have been increasing; today the number stands at over 54,000 students studying from 180 different countries (The University of London, 2013).

Another great British institution, the Open University started in the early 1970s using the most advanced computing application available to facilitate distance learning, as well as TV and radio broadcasts to support their distance learning courses (UNESCO, 2002). The UK Open University has set the standard for distance learning institution, this model has been established in other European countries including Germany the

1 http://www.lon.ac.uk/

2 http://www.open.ac.uk/

Fernuniversität, Spain the Universitat Oberta de Catalunya and Universidad Nacional de Educación a Distancia (UNED), in Netherlands the Open Universiteit and the Universidade Aberta of Portugal (UNESCO, 2002).

Zemsky and Massy (2004) state: "the major innovation in education is e-learning technology". The Department for Education and Skills announced in 2005 that e-learning should be adopted by all UK higher education institutions (Brown, 2005). This is one of the factors that encouraged higher education institutions in the UK to adopt computing and internet based tools for learning on a significant scale.

The need for higher education institutions to support their academics in a time of change is enormous. When institutions in the UK increase their use of e-learning technology; departments and schools within are often left to cope with the change with minimal guidance and support. Because of these enormous changes, the support required for academics has never been more important. Additionally, education and learning is universal, and requires academic activity to be global. With the development of E learning technologies, this process of learning through exchange of ideas between academics globally has become easier for academics, but also, far more valuable than ever before. To take full advantage of this opportunity, academics require support with understanding and adapting to use of online technologies.

1.2 Research issue

This study focuses on how e-learning tools can be accommodated for the academics' needs by understanding what academics actually want, what problems they are facing since they have adopted to use the technology by force or by choice. The ultimate aim is to address a technical issue existing that may cause failure; or a functionality that can be added to make academics more at ease when using the tool; or a tool that can help in their role as teachers during this time of change.

In order to gain a better understanding of e-learning technology, it is necessary to select a specific area where this technology has been implemented and to view it from a particular group of users' perspective. The two common groups of users in educational institutions are the students and teachers. Since students' perspective has been covered by various writers (Zhang at al., 2004; Childs et al., 2005; Liaw, 2008) the perspective of academics will be studied because a gap in knowledge exists as will be shown in literature review chapter. Thus this study performs an in depth examination of the academics' point of view, how their role has changed and the underlying factors causing negativity in the academics' working environment.

1.3 Aim / Objectives

The aim of this research is to explore the extent to which online learning applications have increased academic workload by requiring academics to spend time supporting online learning. The research objectives are as follows:

1. To identify the effects that online interactions have on teaching staff.

2. To investigate the changing requirements for supporting teaching staff in the management of their online presence.

3. To propose a framework providing a technical solution to improve the online interactions in an e-learning environment for academics.

4. To design, develop and evaluate a technical prototype based on the proposed framework which will address the online interaction issues.

5. To add to the body of knowledge on the use of e-learning environments by academic staff.

The research is designed with a focus on academic needs, the problems they are facing, the perception they have and ways technology can be adjusted to suit their needs. The overall objective is to add to the body of knowledge in the use of the e-learning environment by academics.

1.4 Significance and outcome of this study

It has been over a decade since e-learning has become popular. The demand for it has been growing rapidly, especially among people who have a keen interest in lifelong learning: answers are required to immediate problems faced by academic staff (Liebowitz and Frank, 2010). What are the effects on academic staff? What are the changing requirements? Is there any research carried out to mitigate these challenges? The answer is that concentration has been on the student perspective and substantially less research has been carried out on the perspective of academics administering e-learning.

Many researchers have written on the demand from student of instant feedback from academic staff that e-learning technologies are used to gratify students academic needs

by demanding immediate responses (Burd and Buchnan, 2004; Vrocharidou and Efthymoiu, 2012; Nandi et al., 2012). For these reasons it is imperative that research such as this be carried out to identify the issues involved in managing an online presence in the e-learning environment and the technological support required for academic staff.

This research will contribute to an understanding of academics' needs in changing times and contribute in a practical way by a prototype application that will be an addition to the current tools that academics use, with the intention of reducing academics efforts in delivering and creating content for teaching.

The aim is to publish key aspects of this research that will benefit both academics and institution managers in understanding the challenges academics face. It is hoped that institution managers will be encouraged to be open minded in accommodating solutions or suggestions that may benefit academics' role.

1.5 Definitions

Many terminologies relating to computer learning have been used. One such term is Virtual Learning Environment (VLE), defined as "Computer-based environments that are relatively open systems, allowing interactions and encounters with other participants and providing access to a wide range of resources" (Piccoli, Ahmad and Ives, 2001: p.402). This definition is referring to individuals engaged with various technologies for learning purposes.

Piccoli et al., state that the term Computer Aided Instruction (CAI) is similar to VLE except that VLE is broader and includes communication between learners and teachers. Other terms include online learning, computer based learning (CBT) (Michaelson, 2003), online education, distributed learning (Alavi, Marakas and Yoo,

2002), internet learning and web based learning (Boisvert, 2000). Another term E-teaching (Mohammad, 2012) has been used to highlight when a teacher is using the technology to teach as opposed to the term e-learning which also encompasses students use of the technology to learn; however all of the terms have similar meanings. For this research, the broad term e-learning will be used; this encompasses the above terms and refers to teaching or learning achieved by the aid of electronic technology.

Currently academics in higher education institutions use three modes of learning. Full time e-learning use is where all their teaching activities and research are done using technology (Song et al., 2004) such as computers, phones, postal and online services: email, internet, discussion boards and Learning Management Systems such as Blackboard and Moodle.

The second mode of learning is called blended learning, where academics teach in a traditional classroom setting and technology is used to enhance and support the learning (Garrison and Kanuka, 2004).

The more traditional mode is where academics are lecturing and presenting instructions: the tool is the pen and paper, and black or whiteboard is the main aid. These academics do not use technology in their learning (Garrison and Kanuka, 2004).

In this research the investigation will take place with academics using any of the above modes of learning: full time e-learning, distance learning or traditional class based learning.

1.6 Methodology

The research is an inductive study where data and information is discovered, and narrowed down to identify cause, solution or theory. It is intrepetivism in epstimology as it is based on academics' experiences. The research was based on the collection of primary data through interviews and transaction logs from Middlesex University. The reliance was fundamentally based on primary data via interviews and triangulated with data from transaction logs. The interviews are exploratory and solely based on the needs of the academics. Analysis of both sources determined the findings.

A prototype solution has been developed from the findings and piloted with four academics to meet the goal of this research to produce something practical and beneficial to academics. A second round of interviews was conducted with academics who piloted the software to gain feedback as to their opinion; this ultimately decided the success or failure of the prototype application.

1.7 Structure of the thesis

The research starts by identifying the effects of the presence of the e-learning systems and its causes on academic staff. This led to investigating the changing requirements for supporting academic staff in their management of the e-learning technology.

The effects of e-learning on academics and the changing requirements for supporting academics staff has been gathered from literature review, interviews and transaction logs from Middlesex University. After the identification of the changing requirements, this allowed for a technical solution to help academic staff to facilitate learning. Then the process of designing, developing and evaluation of a prototype solution has been presented.

The first chapter contains the introduction that introduces the research area.

The second chapter, the literature review, explains the growth of e-learning tools. The literature highlights some of the underlying factors that contributed to the rise of e-learning such as Globalisation and UK Government policy. The literature review identifies problem areas and concerns from the practitioners and writers on the technology. Their view points to six areas of concern where gaps in research exist and describes the current ongoing development with e-learning technology such as mobile and hand held devises. The literature review explores and verifies current issues with e-learning, and discusses future issues that may arise.

Chapter three describes the research methodology selected and justification for it. The chapter starts with research design, the tools of data collection, addresses ethical concerns, the validity of data and covers how the analysis was carried out.

Chapter four presents the results of data collection and analysis. The data collected from interviews has been analysed and categorised according to the research objectives. The perspectives are exclusively academics in relation to their use of e-learning technology and not the view of all e-learning users. The findings have identified numerous disadvantages compared to few advantages, a wish list from academics was derived where they suggested ideas on how academics maybe supported by institution management. This chapter also confirms, in its discussion, that there is sufficient justification and argument for the development of the technical solution: the prototype Knowledge-Base Forum.

Chapter five takes the findings and lays out the framework of the developed prototype application to support the academics' role. The prototype is piloted at Middlesex University to get a preliminary feeling for the application and how academics react to it.

Chapter six concludes this research.

1.8 Conclusion

The introduction chapter lays the foundation of this research. It introduces the history of technology used for delivering learning, and describes the research issues that have come about due to the use of e-learning technology. The aims and objective are stated and the structure of this report is outlined. Based on these foundations the investigations have taken place and a detailed account is presented.

Chapter 2 Literature Review

2.1 Introduction

With the advent of e-learning technology, academics are facing the challenges of acquiring and implementing IT skills for the purposes of teaching. The internet is a perfect tool of learning that offers flexibility and expediency to learners while at the same time offering endless opportunities for inventive teaching (Novak et al., 1999; Applebome, 1999).

Some of the reasons for e-learning technology success are: e-learning systems are likely to encourage student learning resulting in a higher level of student engagement (Hiltz, 1993; Wang and Wang, 2009; Hardaker and Singh, 2011; Macharia and Pelser, 2012). E-learning can be better than face-to-face learning, the quality of interaction and timely feedback is superior, with good course design which can untangle the geographical limitations to education (Chen and Young, 2006). The financial benefits as a result of enrolling large quantity of students made e-learning systems irresistible to institutions.

Since then many research articles and case studies have been completed on how best to use the technology. The vast majority of the research is focused on the needs of the student. Ever more ideas, recommendations and solutions have been developed to improve student learning. For example, Macharia and Pelser's (2012) study of computing technology in Kenyan Higher Education formed valuable insights into the reasons that influence e-learning acceptance by students, the study provided new ideas for higher education management for dissemination and infusion of computing technology for the purposes of learning. They concluded that the availability and access to computing technology, the quality and character of the institution leaders play an essential role to the success in e-learning diffusion.

However very little research has been undertaken that discusses the perspective of the academic staff. Even less research has been conducted on the effects of e-learning on the academic staff. This is at a time when administrators and academic managers are increasingly pressuring academic staff to incorporate technology into teaching for more active learning (Steele and Hudson, 2001; Eynon, 2005; Olaniran, 2006).

2.2 Pros and cons of e-learning

There has been much discussion amongst the research community about the pros and cons of e-learning technology. Some researchers highlight this issue of superiority of e-learning technology saying blended learning has greater advantage than traditional learning specifically in the declarative knowledge such as recalling definitions, facts terminologies or concepts as opposed to procedural or problem solving knowledge (Means et al., 2009).

A study conducted by Campbell et al. (2008) with students from a postgraduate research module concluded that the course could be run wholly online as successfully as blended learning, and that the online discussion could be just as useful as face to face discussion. They also found that face to face teaching does not necessarily mean that a student will attain higher grades than the grades of those taking part in distance learning; in fact, an increase in e-learning activity was associated with higher student grades.

Learning technology is not just used in educational establishments and businesses but also used in the Armed Services. For example, e-learning technology is an invaluable training tool in airline or combat simulations or building models of structures to support the training process (Welsh *et al.*, 2003). Some practical skills cannot be just talked through; although students will pick it up through discussion, real life practical experiences or at the least simulation practices are required to aid in the teaching and further the students understanding.

Foley (2009) collected data on academics using e-learning, and concluded that uptake of this technology had been a success. He stated that e-learning tools increased interactivity between students and academics, and also interactivity amongst students which led to a better learning environment. This conclusion was also ascertained by Beldarrain (2006: p.140):

> *"As new technologies emerge, instructional designers and educators have unique opportunities to foster interaction and collaboration among learners, thus creating a true learning community"*.

Boulos *et al.* (2006: p4) state

> *"The combination of wikis, blogs and podcasting technologies, has the potential to both liberate and tie learners together, creating dynamic learning communities*".

Diaz and Entonado (2009) discuss other positive aspects of e-learning. They state that face-to face teaching takes time to prepare mentally and requires time for explanation, whist e-learning material may already exist and therefore can be quicker to collate and saves the academic time, therefore in occasions e-learning can be better. However Zhao et al.'s (2005) research found advantages for blended learning rather than purely online learning experiences. They add that teacher's involvement is crucial; the greater the teacher's involvement the better the learning outcome.

There have been numerous researchers who have stated that e-learning has not delivered as expected (Robertson, 2003; Guri-Rosenblit, 2005 and Njenga, 2010). They argue there was a great hope invested in e-learning technology however the hope has not been realised; e-learning technology has not been better than class room teaching and has not delivered better learning than traditional methods of teaching.

Other researchers have pointed out a reason for the failure of e-learning technology is because the design is not compliant with learner centred design; this refers to students not being involved thought the course design (Penna et al., 2009).

Dublin (2009) states that "having a great e-learning strategy and having great e-learning programs are not guarantees of success. Without a clear and well-thought-out implementation strategy and plan "one's e-learning efforts will most likely fall far short of one's goals," (Dublin, 2009: p.291).

Michaelson (2003: p.63) states "for all the hype and expenditure, advances in eLearning have been limited". As can be seen, e-learning has gained various opinions from academic researchers; some arguing that e-learning is superior to those who believe it to be a complete failure. The discussion should be viewed in a balanced way; where e-learning technology is appropriate it should be encouraged, where it is seen to be ineffective it should be treated cautiously. Where blended learning is appropriate it should be adopted, where it is convenient for distance learning it should be implemented.

Gunasekaran, McNeil and Shaw (2002) discuss four reasons for e-learning failure and for each put forward a suggestion to overcome the difficulties. First, failure is due to high expectations with inadequate investment with finance resources, time and funds. Second, appropriate learning design is not taken into consideration. Third, the software is purchased or developed without adequate planning, and fourth, organisations fail to prepare students and instructors for e-learning.

2.3 Globalisation and cost implications of e-learning

The rise of e-learning technology used by higher education institutions can be attributed to globalisation. This is referring to political and economical phenomena, a worldwide integration of views, culture and products (Hall, 1996; Clegg *et al.*, 2003; Sidhu, 2005; Spring, 2008; Raghuram, 2013). The growth in the use of e-learning technology no doubt adds to globalisation as educational institutions are trying their utmost to break down geographical and social boundaries to offer distance learning education, this leads to an integration of academic standards and views.

Advances in technology, infrastructure and transportation are major factors in the rapid pace of globalisation. Globalisation has been named to explain all sorts of effects such as reduction in household income, introduction of student fees, growth of international tourism and even the cutting of the public sector budget (Brown, 1999).

Globalisation can be further identified where the fusion of technology and the pace of globalisation meet. This growth is spurred on by companies competing in national and international markets for profits that require technological advances over their competitors. Not only is technology used for industrial competiveness but also collaborations, sharing of information and knowledge used by international organisations, governments, academic establishments, researchers and non-profit organisations (Archibugi and Michie, 1995).

The rapid pace of advances in e-learning technology can no doubt be attributed to Globalisation as institutions in the UK are competing to gain more fee paying students without geographical boundaries and where institutions are trying their utmost to offer flexible education so age, academics background, and experiences are not a hindrance to pursue academic studies. The rapid pace of embracing e-learning technology has ramifications on academic staff; it creates unwanted pressure and the results are hard to monitor as to whether e-learning technology is being used effectively (Clegg *et al.*, 2003).

The UK Government has encouraged the rise of e-learning within higher education. In 1997, the Labour Government used the globalisation argument to justify and encourage UK higher education institutions to adopt ICT for learning. Since then, the Government agenda remains the same to push forward with technology to enhance learning (Brown, 1999, 2006; Mee, 2012; Allan *et al.*, 2012; Jackson and Fearon, 2013).

Globalisation has affected academic staff and student learning with increased use of networked medium and telecommunications for the purposes of flexible learning. In

other words education has been globalised by computing technology (Ally, 2004; Selinger, 2005; Zondiros, 2008).

E-learning technology offers return on investment for institutions; it offers cost effective training compared to face to face learning, hence e-learning has increased due to reduction in cost. For example, IBM saved $200 million in 1999 due to the introduction of e-learning technology and Ernst & Young reduced training costs by 35% while improving consistency and scalability (Strother, 2002).

Institutions are able to offer courses at short notices with a huge number of participants, mainly because the participants are geographically dispersed. Welsh (2003) provides an example of a large organisation, Dow Chemicals successfully trained 1000 students within a week having a seating capacity of 20. Such a target would have taken 50 weeks to achieve through face-to-face learning. As a result, Dow Chemicals saved $30 million by implementing e-learning technology during 2003 (Welsh, 2003).

There is a disadvantage and cost involved during implementation and early stage of the e-learning strategy. The cost includes software and hardware purchase, the recruitment of qualified staff and the training of users. The cost can be significantly high but in the long run it can save both money and time (Phelps et al., 1991; Wisher and Priest, 1998; Whalen and Wright, 2000).

E-learning within higher education can seem ideal for institution management as this can increase the student-academic ratio; in theory one teacher can teach hundreds or thousands of students. This allows institutions to recover their investment. The results of e-learning implementation include the capacity to accommodate higher numbers of students within a university, thereby increasing its income, and reduction in academics. Academics can be reduced when programmes are designed for a student centred learning model, where direction and instruction is given to students and the student then makes the effort in research and their own learning. However there is a human cost to this strategy; the increase in number of students can leave academics with a sense of

being overwhelmed (Rovai, 2002). Academics being overwhelmed and an increase in number of students per academic are linked to poor retention and poor pass rate which is bad for any educational establishment (Boyle *et al.*, 2003; Blatchford *et al.*, 2011). This raises the question: what is the ideal student-staff ratio and how can academics be organised to meet this challenge? According to Rovai (2002) eight to ten students in a class is a reasonable estimate to promote good interactions in an online learning environment. Twenty or thirty students are a reasonable number that a single online instructor can realistically handle in a single class. Over thirty students can be managed by a team using teaching assistants with the principal academic. The number of students can increase as long as a team of teaching assistants aid the learning.

2.4 The Six Challenges

There are many challenges faced by academics regarding the use and success of e-learning in an academic environment. Current discussion around the challenges in this area can be divided into six categories: learning styles and culture, pedagogical e-learning, technology, technical training, time management, and health challenges. The six challenges have been extracted from literature and they highlight some of the key issues researchers have discussed regarding the field of e-learning. Each challenge is significant; academics being aware of the challenges will help them to seek appropriate guidance.

1. Learning style and cultural challenge

Everyone has their own learning style along with their cultural influences; the ones who are taught using their own learning style and taking into consideration cultural aspects of individuals will perform better academically (Sywelem *et al.*, 2012).

To achieve the best learning outcome it is desirable to have an understanding of students' learning styles. Online students' learning styles can be unclear, this has implications on how academics develop learning material. Some students learn through

interacting, some prefer learning through visual presentation, and some by listening to instructions and using written notes. This challenge has an implication on the learning outcomes and poses a serious issue for academics to understand the learning styles of their students in an e-learning environment.

There are various teaching styles; notable approaches are didactic, facilitative and socratic and the experimental method (Banning, 2005).

The didactic is the traditional method mainly involves lecturing and is very much teacher-centred where learning is involved mainly through note taking and listening to teachers. Traditional methods of teaching continue to use the lecture as a means of teaching and an economical one where one academic can disperse knowledge to large audience (Walkin, 2000). However didactic can mean full responsibility of teaching on academics as it is strongly teacher centred; the teacher is the knowledge expert, all the learning objects and knowledge flows from the teacher

The facilitative learning moves away from the strong teacher centred learning to what is known as self-directed learning, where the academic uses various strategies by acknowledging students past experience and learning styles to encourage student to become independent learners. To be a competent academic to be a facilitator they have to be competent in their knowledge base, have confidence, authority and be empathic to students' needs and individual learning style.

The Socratic method is heavily student orientated learning so students are able to think independently and various strategies can be used by academic such as quizzes, discussion, strong group work sessions with strong emphases on communicating with peers, self-assessment and research for the purposes of making student critical thinkers. However not all students may able to reach this position of critical thinkers without proper guidance, encouragement and nurturing. The time and effort spent nurturing students can be enormous (Banning, 2005).

Researchers have pointed out that no particular learning style is dominant amongst students; therefore teachers are expected to understand various learning styles to accommodate students (Mupinga, 2006). When a student has a strong preference to a particular learning style it becomes impossible for them to learn if materials and resources are not delivered using that particular method (Zapalska and Brozik, 2006).

A popular method of identifying the learning style of an individual is the VARK questionnaire. This process identifies a learning style of a student and categorises it as Aural, Read/Write, Visual and kinaesthetic. Aural (A) refers to students who prefer to learn through receiving verbal instructions. Read/Write refers to the learning style of students who prefer reading instruction and writing notes as the best way to learn. Visual (V) are students who prefer the utilisation of visual objects as a way to learn such as graphs, charts and videos. Kinaesthetic (K) is when learners prefer to learn by a doing approach. It should be noted that a student may fall into two categories but one may be a stronger preference than the other (Zapalska and Brozik, 2006).

A current challenge for academics in an e-learning environment is to understand the different learning styles of different students for better learning outcomes. The traditional method of learning may not be adequate in the modern day classroom where e-learning technology is playing a major role in the delivery of education. In principal the key to understanding the student needs is to understand the diversity in the virtual class (Folley, 2010; Donahue and Glodstein, 2013).

Researchers have pointed out various problems when instructors use e-learning technology. Phipps and Merisotis (1999) authored a 48-page report reviewing and examining research papers throughout the 1990s on the effectiveness of e-learning technology. They put forward recommendations to cover the gaps in research that require further investigation. They recommend that "there needs to be more emphasis on individual differences such as gender, age, educational experience, motivation and learning style" (p.3). Implying current research on e-learning learning does not identify individual needs. This poses a question as how instructors are coping with the

technology to teach a variety of students with different educational needs, and coming from different backgrounds. It is common that students, lecturers and institutions use a variety of different application platforms for learning and teaching, therefore they suggest that in the future "research should focus on the interaction of multiple technologies rather than the impact of single technologies" (p.3).

Taylor (2002) describes e-learning as exceptional for courses that require cognitive learning. However for teachers dealing with cultural barriers, differences in student attitude do not work well in the e-learning environment. Academic staffs that are better trained will bear the fruits of higher student learning. However if the teaching staff are not trained in using the e-learning technology and do not have a strong grasp of the operation of the technology then student learning is likely to suffer.

Teachers must understand and recognise individual learning styles of the many hundreds of students (how they learn and how they perceive) in the context of online education. It is important to convey and share the information with students (Brozik and Zapalska, 2006). For the hundreds of students who usually are not seen by academics in the e-learning environment, at present, the technology practice does not help such a scenario.

Hannon and D'Netto (2007: 419) state "instructors usually fail to take into account cultural differences when designing and delivering courses". He argues that because pedagogy and technology do not reflect the culture of the student, it reduces his or her learning outcome and the cultural differences affect their ability to work with e-learning technologies. The outcome is reduced because students of different languages respond differently to how things are organised in e-learning technologies and also students of different cultures have different abilities to work with e-learning technology.

Although there are models and theories proposed to deal with individual and cultural learning differences in the e-learning environment, there is a greater urgency for content

providers to design courses and materials that take into consideration these differences and "engages culturally diverse audiences" (Callaghan et al., 2008: p.56).

When a student has a preference to a particular learning style then it becomes difficult to learn other ways, which means academic must be aware of different styles and needs to design learning materials that enables students to learn. This is the most important role of an academic. Therefore understanding learning style is critical consideration during course design and institutions should provide resources and training for academics to meet this challenge. However this is a time consuming and costly task, lot of time and effort is required and the courses material and students learning style has to be assessed when new student cohort joins. If learning style is not recognised then a possibility of learning will not be achieved and it is the most important challenge to meet.

2. Pedagogical e-learning challenge

Pedagogy is concerned with enabling the best way to achieve learning (Teo, 2006); if pedagogy is not considered then the desired learning outcome will not be achieved. Successful pedagogy requires the teacher to understand how students learn then design and deliver course materials, and mentor students appropriately, so that knowledge and skills are passed on. In this way, e-learning will produce the return on investment. Pedagogy should be the cornerstone to any e-learning technology; without pedagogical principals learning will be hampered.

E-learning requires a different approach to pedagogy especially in areas such as individual and group interaction and online assessment. However these skills are not alien to all, distance education has been around for decades using postal services, TV, and telephone.

As e-learning is currently widespread, academics who are not equipped technically to handle developments of materials and delivering online modules are hampering

progress, and they require extensive skills development (Ellis, O' Reilly and Debreceny, 1998).

However, not only are the technical skills an issue but content should be appropriately designed for distance learning; it is not simply about "dumping large amounts of text onto a website" as this is inefficient (Leask, 2004: 347). In order for academics to effectively make the transition to become online teachers they need to do more than just develop new ICT skills; it should be pedagogy based (Morley, 2010).

Other researchers went further and stated learning different pedagogical online strategies by teachers is not sufficient in an online learning environment, it should include academics correctly interpreting students' online written text, understanding the context, and understating group dynamics with individual needs. This will then make online learning more successful (Turvey, 2008; Loveless, 2011). Having a well designed course that is pedagogically focused, and academics understanding the different strategies of online learning with the understating of diversity, context, group dynamics is not sufficient, all require the institution management marketing the pedagogical benefits of online learning with practice examples that academics can relate to so they are encouraged to use the e-learning technology (Jackson and Fearon, 2013).

Conrad (2004) highlights four areas of expertise required to be an effective online instructor; Pedagogical, Social, Managerial, and Technical. His study is based around a questionnaire delivered to five new academics, new to the e-learning environment, to learn their views and experience. The numbers of participants was small, but the study gives insight into first time e-learning experiences from the perspective of academic staff. Some of the concerns academics raised related to pedagogy and e-learning as follows:

1. They were concerned about loss of control, of the technology structure not giving them time to concentrate on certain topics before moving in to a different topic in

contrast to traditional methods of learning where lecturers can stop, explain, quiz their students to see if they understood, if not then they can explain further until happy to move on.

2. One lecturer found it difficult using the WebCT platform to look back thorough different postings to retrieve the messages of interest.

3. It was pointed out that when teaching online a lecturer could feel they are "left in the dark" (2004: 35) where they are unable to observe students.

4. Management issues involving "agenda setting, pacing, objective setting, rule making and decision making is so closely related to pedagogical and the social roles", (2004: 36) that the academics did not separate online teaching and management duties. Some of it was due to the online course structure where management process is already set. However, some course management decisions were applied from academics' past experience without reflection. It would be interesting to learn where e-learning systems management process stop and academics' management decisions start.

5. Since a lot of the management process is inbuilt into the course structure, once the course is mounted and initialised it is hard to change the structure or modify the course material.

6. Concern was raised in the discussion chapter where the author picks up on the social issue and that it should be comfortable for online learners. He suggests lots of the lecturers are unaware of emoticons. The emoticons can be a source of providing a comfortable environment and also giving a sense of feeling to the discussion with students.

Conrad's study highlighted good pointers but did not concentrate on how much training or what a programme of enrichment required to fulfil the areas of expertise needed within an academic department to solve to pedagogical and the e-learning concerns.

Burd and Buchanan (2004) suggest four distinct learning styles: imaginative, common sense, analytic and dynamic. The dilemma to instructors is how to identify and understand the learning styles of online students when they cannot be visualised, especially when they have limited time and many students enrolled. Also they recommend "to be effective, teachers need to communicate with non-participants privately to encourage discussion (p.24)". This is a brilliant idea, however finding non-participants may not be easy; it may require time and effort that may not be practical for academics to accommodate.

Govindasamy (2001) says e-learning pedagogy should consist of a few important aspects:

First content: material should be in learning objects, it is an independent class room session comprising small instructions and independent to other learning objects. A test should be assigned before access is given to the learning object. Students that fail the test should be directed to relevant learning material enabling them to gain sufficient understanding to start the learning object. After the learning object is completed a test should be conducted to determine if they learned the required learning targets.

Second storing: The learning object should be removed when the task or knowledge is outdated. The learning objects should be reviewed, modified and corrected to reflect current task.

Third availability: the learning objects should be available when students require them, called 'just-in-time learning'.

Fourth student support: correct support should be put in place as e-learning can be different to class room learning where the teacher is available to answer student queries. Support should be programmed into the learning object and ample feedback should be provided. Even keeping track on student progress is required so the instructor can target areas of weakness.

Fifth assessment: appropriate test and assessment should be in place such as MCQ, essays, exam questions and project deliverables. All should be incorporated within a course for a successful learning outcome.

As well as student learning style, the Pedagogy is an important and serious consideration for learning, for it is the way an academic administers learning, it is not about dumping information on a website and hoping students will learn it, but a process to be followed to enable pedagogy in the e-learning tools, which institutions should show utmost importance.

3. Technological challenge

Technical challenge refers to development issues such as the bugs, the speed, the errors, functions and features not correctly working or do not work according to what academics require.

In reviewing e-learning literature there are various criticisms of the quality of the e-learning systems currently being used. Issues have been raised that include: usability problems, bad performance, institutions being unable to customise according to their requirements and sometimes criticised for having a teacher centred system rather than learner centred system (Chua and Dyson, 2004).

There are more than 35 e-learning technology vendors in the market (Edu tools, 2009); however, a study carried out in Australia found Blackboard to be very popular amongst educational establishments (Paulson, 2002). However Blackboard "is limited to its

environment'" (Farmer, 2004: 5), this is referring to Blackboard's features restricted to its own environment. It does not allow discussion, updates, notices and various other messaging within blogs and topics from different vendors, and it does not allow discussion forums to be directed to students' personal email addresses which is a disadvantage to student engagement. This limits the academic staff and students to a particular environment even if they are not familiar with it or do not like it.

Technical support to academics is lacking in comparison to the desire of learning success and the profound use of e-learning technology. The great desire is met with insufficient investment in infrastructure and technological assistance (Reeder et al., 2004: 91-92).

Institutions have a variety of applications and computer operating systems for various uses such as the student registration system, and research support applications such as NVIVO and SPSS. All these applications have to be merged and linked within one e-learning environment to make it accessible and enable central support; however, this requires the merging and linking of various applications. This creates increased network traffic to support the centralised infrastructure, thus it should be robust and have enough capacity and capability to handle student academic communication. This is a complex process especially where old and new applications meet, and is a challenging process effecting academics who have to use the system (Nielsen et al., 2011).

Technical errors, bugs, slowness is critical if academics are to use the system and is critical to the success of the e-learning technology, if the system does not function correctly then the technology will not be used and negativity will arise in using e-learning technology, which has a big ramification for institutions as they have invested hugely so the technology should be used effectively for the return in investment.

4. Technical training challenge

Training challenge refers to the training requirement that will enable academics to learn the e-learning features and functions correctly and to use them effectively.
In reviewing e-learning literature, there are various criticisms of poor training provided by institutions to academics. Issues have been raised that include not enough training, inadequate training, training styles in use that do not fit academics personal preferences, lack of hands on practice, and also how to create materials according the pedagogical requirement was missing from the training scenario.

Volery and Lord (2000) explain the three requirements needed for effective e-learning success:

- Technology
- Instructor characteristics
- Student characteristics

Technology needs to improve; however, the instructor's characteristics and familiarity with technology are most important in terms of having a successful learning experience. Teachers who are motivated and have an encouraging attitude towards the e-learning technology will enable a positive learning outcome. They state it is "crucial that the instructor has good control of technology and is able to perform basic trouble shooting tasks (e.g. adding a student at the last minute, modifying student's password, changing course settings)" (2000: 218).

They also state that the instructor must have the ability to motivate students, show empathy, resolve emergency problems and respond to emails rapidly. A positive attitude to e-learning depends on how confident they feel about the technology; if one of the requirements is the ability to troubleshoot basic problems in the e-learning system, then academics in the UK would potentially not feel confident as they are not trained to

troubleshoot, nor change passwords or course settings never mind resolve emergency technical problems.

They state student characteristics such as intelligence, motivation, and computer experience are crucial to the success of online learning. We cannot agree that all students will join university with computer experience as students may be novices or intermediate at using computers (Smith and Morris, 2003). If the capabilities of students are at best intermediate then there has to be organised training for the students. If sufficient training is not implemented then the burden of training will fall on the overburdened academics. This is supported by Salmon (2000) who suggests that instructors do not have sufficient training to make them successful and productive to online learners. Similarly Gerrard (2002) states the need of academics is understood as technological skill improvement such as how to create a better presentation and how to upload it on e-learning systems rather than learning new e-teaching skills to improve and aid student learning.

According to Taylor (2002) academics are only good as much as they can adapt to the new technology; this is a challenge for most academics. There is not always the technical challenge but also time management, busy schedules and not all content can be presented well in an e-learning environment.

According to Gerrard (2005) two types of training are required for online teachers. First is in-depth training for those who spend the majority of their time teaching by using e-learning technology and the second is a shorter course for teachers who will use the technology in addition to face to face learning.

A case study by Wijekumar and Spielvogel (2006) discusses and recommends many ways the intelligent discussion boards of the traditional e-learning system can be improved to help students' learning. The case study also advises that teachers must be trained and developed. To support their opinion they quote Bilgnaut and Trolip (2003:

p.200) that the tool can be "a powerful resource for learning if the instructor knows how to encourage thoughtful posting".

A study carried out by Cornelius & Macdonald (2008) states academics that teach distance learning programmes for the Open University in Scotland, who are not based on campus, fail to acknowledge the needs of distance learning in terms of training and support. The Open University is one of the first institutions in the UK to take distance learning as their core method of delivering education and if their online support and training is not adequate to support their teachers, then a reasonable question can be posed to the state of all other institutions who have taken up e-learning much later than the Open University. Those academics who attended training complained that training was not as they expected; it was an overview session without emphasis on practice, it did not give them enough confidence, it was not inspiring enough for them to carry on learning, training sessions was badly planned with errors, and it was rushed and not fully functional (Jackson and Fearon, 2013).

Therefore providing adequate training would help academics do their job effectively whether this relates to managing online discussion forums, or identifying pedagogical needs amongst students (Allan et al., 2012). Training is vital how to academics utilise pedagogy in the e-learning environment, how do they adapt learning style in their material, correctly using the e-learning features are important, if academics do not know then investment will not yield the expected result.

5. Time management challenge

Academics that use e-learning systems face difficulties in managing their time. According to Reeder (2004) some of the "cyber culture values" are characterised by speed, reach and quick response. However in recommendations set out by Burd and Buchman (2004), the prerequisite needed to be an effective online instructor is that academics must visit the discussion page at least once a day to see if there is a posting by students. A viable question is that visiting the discussion board once a day may not

be seen as adequate according to cyber culture values. Some researchers have stated that academics should always maintain a vigorous presence on online discussion boards so they control discussion, provide answers and feedback so students do not disengage from the course (Vonderwall *et al.*, 2007; Mayes *et al.*, 2011; Nandi *et al.*, 2012).

A case study conducted by Mihhailova (2006) aimed to find some of the challenges faced by lecturers who were trialling e-learning technology in an Estonian University. It concentrated on ten interviews conducted with lecturers and found that time management was complicated as answering queries or preparing lecture notes took longer than expected and there was "no compensation system or clarity in pay for the lecturers" (2006: 275). Understanding and improving how academics can balance their workload was a key recommendation of this case study.

Academics in the UK are finding it difficult to keep pace with postings in the discussion boards and forums. "The volume of traffic on the forum affected the time needed to keep up to date" (Cornelius and Macdonald 2008: 52), causing academics sometimes to skim over posted messages. They also found that other academics who are persistent about checking every posting become selective when traffic increases.

There is a difference of opinion whether e-learning reduces time and effort of academics. Some of the literature states e-learning has automated and streamlined some of the administrative tasks making communication easier and that having a central repository to place content is freeing up time for quality contact (Feldstein and Masson, 2006; Heinrich, Milne and Moore, 2009; Kotzé and Nageland, 2010). However other researchers state that e-learning becomes 30% more time consuming for academics than traditional classroom teaching (Conrad, 2004), not just due to the increase in working hours but also academics' efforts increase by 14% to teach effectively (Tomei, 2006).

Literature points out that while the traditional methods of learning have changed, teacher and student roles remain, but e-learning allows the 24 hours a day for a class to run, and verbal conversation have been replaced with a permanent written discussion forum where students can update any time of the day or night (Clark, 2001). This means academics have to be working nights, weekends and holidays as the student expects to have a reply immediately and "if things go wrong then they have a semi-permanent existence on the screen" (Gustafson and Gibbs, 2010: 208The literature shows a heavy demand is made on academics when e-learning is introduced, if academics are overworked and do not have time then student learning will suffer, especially when they are not being compensated for the extra work they are carrying out, which will lead to low academic moral and may jeopardise learning and institution image to be damaged.

6. Health challenge

The health challenge refers to the ill effects of using computing technology for learning and teaching. Literature provides various criticisms which suggest that the impact of long term usage of computers can do harm to people's health, through electrical radiation, harm to eyesight, backache and neck ache amongst others (Nazarlou, 2013). There is also a condition known as Repetitive Strain Injury (RSI), which describes pain resulting from using the hands to perform a repetitive task such as typing, clicking a mouse too often, or writing. This develops a pain, stiffness, numbness and cramp in the muscles, nerves, back, neck area, shoulders, forearm, and hand (Yassi, 1997).

As institutions are relying on e-learning more now than they were before. Therefore institutions must ensure that they provide academics with the correct equipment and guidance to reduce the health hazards associated with using computing technology. Keyboards, screens, chairs and mouse mats are all examples of products which have been modified in recent years to ensure they are ergonomic and reduce the risks to health that are associated with their use. Institutions should educate academics on the health risks, so that they can take precautionary measures to avoid risks, for example

often taking a break from looking at the computer screen to avoid poor eyesight, headaches and migraines.

Higher education institutions were keen on e-learning due to its availability 24 hours a day, as students preferred convenience and flexibility. Due to the adoption of e-learning for convenience and availability, institutions must heed the warning: "The social dynamics of education changes once participants choose online education" (Smith and Rupp, 2003: 101). With the introduction of education being required 24 hours a day, the role of the academic has to change, to ensure that they can effectively interact with their students when required.

Research conducted by Allan and Lawless (2004) therefore explains that as online learning and collaboration increases, it is believed this can itself cause stress to academics. They may feel compelled to work during the evenings, at weekends, and even during their holiday periods, to be there for their students when required. This feeling of not being able to take a break from their work is likely to cause frustration, a decline in academics job satisfaction and low moral (Jackson and Fearon, 2013). These may lead to stress or other health conditions. Having academics who are dissatisfied with their job or dealing with stress and frustration will be affecting the quality of education provided by the university, thus destroying the credibility of institutions built up over centuries. If educational establishments do not create the correct nurturing ground then no doubt it will effect cooperation and communication that will eventually lead to reduced job satisfaction and stress (Zeffane and McLoughlin, 2006).

Although institutions have introduced e-learning to enable students to achieve their learning at any time of the day, they must ensure that there is no pressure put upon academics to be present online 24 hours a day. Students must be made aware that the academic is only available limited hours, such as 7 or 8 hours a day, and that the hours selected to work may vary each day. However, it must also be said that having a 24 hour a day e-learning service do allow academics the flexibility to select working hours

which suit them. This may allow them to achieve a successful work-life balance, which in turn could result in a reduced stress level.

The health challenge is linked with all the other challenges; if the other challenges are dealt correctly, some of the health problems will be reduced, such as stress and frustration regarding the academic role. Part of the training on e-learning can be used to show how to safely use technology, to minimise health implications. Health challenges should be dealt with by initiating to resolve the other challenges first, at the same time there could be an information campaign developed by the institutions to inform staff on how to use technology safely.

2.5 Cognitive complexity

The six challenges are by no means the only issues for an academic working in higher education: there are also issues with cognitive load, in particular that of working memory being vulnerable to overload from information being processed (Kalyuga, 2007).

The cognitive overload occurs when a processing task in the working memory exceeds the working memory capacity. Whilst the capacity to hold data in long term memory is unlimited, the capacity to hold and manipulate data in working memory is limited (Mayer, 2003). Similarly Jong (2009) states that cognitive load theory in its most basic form is that the cognitive capacity in working memory is limited, therefore if a learning task requires too much capacity, learning will be hampered, academics and students alike.

The short term or the working memory is responsible for processing information (Dosher 2003). The working memory is small compared to the long term memory (Cowan, 2001); therefore when learners perform complex tasks or subjects become increasingly complex the working memory gets utilised more. This memory could be easily overloaded by as much as a few chunks of information processed simultaneously; this limitation impedes information transfer to long term memory (Kalyuga, 2007).

Three types of theory have been put forward to explain cognitive load; first Intrinsic cognitive load relates to the content to be learned, second is the Extraneous cognitive load, which is the load caused by the material used to present the content, and the third is Germane cognitive load which refers to the impact from the learning process (Jong, 2009).

One of the sources of load in the intrinsic cognitive load type is when learners must coordinate materials containing information. Cognitive efforts can be reduced by reducing sources of information especially when duplicated information is being processed. This has been referred to as the "redundant principle" (Diao and Sweller, 2007). The additional cognitive load does not come from the content or material but the processing of material. Academics in this case should reduce the time and effort expended by making irrelevant searches to find correct information followed by having to make sense of content, in order to reduce cognitive load.

Ideal practice would be to have meaningful learning in order to reduce cognitive overload. Meaningful learning can be defined as the ability to use taught knowledge in new situations (Mayer, 2003). Meaningful learning then requires academics to engage in substantial cognitive processing when learning and using the e-learning system. In view of the limits of cognitive processing then the central challenge for e-learning trainers is to design instructions taking into consideration the cognitive limit.
This is a challenge to students, academics, e-learning trainers and managers which can best be addressed by students limiting number of simultaneous learning activities as well as limiting task load.

Kalyuga (2007) states that often one of the reasons for the increase in cognitive load is that learners do not have sufficient prior knowledge of a subject, and instructors do not provide sufficient guidance thus learners are left searching for the answers. Such cases are symptomatic of inadequate training, the over-complex overlay is unfriendly and instructors are remote, thus leading to cognitive overload. The recommendation is to

design systems that optimize the use of working or short term memory in order to avoid cognitive overload (Jong, 2009).

2.6 Human Resource and academic workload

As shown previously in the time management challenge faced by academics: cyber culture value is characterised by the speed and quick response required from academics to answer and update students. Academics are in turn required to maintain a vigorous presence online to meet the demand of student communication. This high degree of engagement with students adds significantly to the workload of academics (Reeder, 2004; Burd and Buchnan, 2004; Vonderwell et al, 2007, Mayes et al, 2007, Nandi et al., 2012).

Education researchers point out that e-learning has increased academics workload in various ways, some of them are as follows: due to technical support offered to students by academics which is not their role, this increases the academic work load (Cavanaugh, 2005). Creating online course material is more time consuming and more labour intensive than face-to-face learning. This increases workload together with the pressures accruing from being given insufficient technical support to use technology (Bright, 2012).

In order to meet some of the challenges faced by academics, institutions have resorted to technology such as e-learning to solve some of the problems. However transition to e-learning is not a simple add-on to classroom teaching: it requires infrastructure, planning, academic support and investment to make it successful. An institution's planning must ensure support to departments that are e-learning intensive. An example of the resources and support required can include IT support in making sure longer hours of help desk remain operational to support academics as well as students. If internal resources are not in place then external agencies should be brought in to support academics (Hillman and Corkery, 2010).

Current human resource literature supports the fact that the workload of academics has increased in recent years due to factors such as a larger ratio of students to academics than ever before, students' diverse learning needs, the higher education funding shortage and funding constraints, and the demand to increase academic research activity and publications across all disciplines (Boyd, 2014). Academics are reporting workload to be severe and undermining their research activity. In line with this, they maintain that workload reduction can be achieved through innovative changes to their work roles, including teaching programmes and teaching methods.

Problems for academics intensify when an institution's management do not provide them with the correct level of support (Chen, 2011). Chen states that competition in the higher education sector has become fierce and universities emphasis on high quality, low cost and high efficiency is overwhelming. In order to maintain a high quality of education for their students universities require excellent academics. Therefore it is critical that they maintain excellent customer relations, the customer in this case being the academics. Research has shown that academics expect a good salary and financial remuneration as well as recognition and reimbursement for extra hours of work and effort invested. If not then relations between the institution and the academic will be strained.

Human resource literature shows that recognition and compensation does not meet academics expectations and academics require administration support. Academics job satisfaction has been found to be high but academics were very critical of stress and low salary. University staff raised concerns regarding workload and stress related to academic duties. Houston (2006) carried out a survey of Australian academics and found that 86% of respondents worked after hours and 39% worked more than 10 hours beyond full time.

Academics complained about the workload in the area of administrative duties such as increase in paperwork relating to the many programmes that is on offer, new systems, policies and workload due to variety of delivery methods being employed for learning and arrangements during summer holidays such as summer schools.

Human Resource literature points out that workload needs to balance well as academics prefer teaching duties to administrative duties. Therefore academics should be supported in their administrative load to increase the effectiveness of academic duties such as research and teaching (Houston, 2006).

Vardi (2008) observed that work performance is adversely affected by poor recognition of effort, an increase in administration specifically on financial reporting, processing documents, and quality assurance.

Three job contracts of academics in an institution based in London were studied; one contract from the English department, another from Psychology and one from Computing. None of the contracts specified the number of hours expected with the use of e-learning technology or compensation details for extra workload. Instead there was a general description stating that it was the prerogative of the department in partnership with line managers to settle the hours spent in administration and compensation. The institutions job contracts state that the role will encompass teaching and administration but they do not specify the number of hours required for each of these tasks, and no specific guidance is given on e-learning.

There is a shortage of literature on the topic of workload and the effects of e-learning on academics and management strategies to reduce workload (Bright, 2012). Of the limited literature available on management strategies to reduce work load Regan (2003) and Bright (2012) made some suggestions as follows:

1. Establish routine for student interaction with academic and refusing interaction if recommended e-learning platform is not used.

2. Not to interact with students outside working hours by answering emails, writing blogs or updating discussion boards. Academics should relay working times to students during the introduction of the course or beginning of the semester.

3. Encourage students to use specific discussion forum.

4. Academics to encourage students to help other students for example, a number of students respond before academics get involved.

5. Appointing a student moderator to handle discussion threads.

6. Academics to use recorded podcasts or audio feed back for students. For some academics this may be a more efficient way of feeding.

7. Academics to get advance training on using the e-learning systems.

8. Being mentored by experienced colleagues on this issue of e-learning.

9. Academics to put up 'do not disturb' sign, or 'out of office' message during online teaching, communication or preparation of materials. Academics should schedule online activity in their departmental diary so their colleagues know they are working. Also phone calls should be diverted to voicemail when academics are online.

2.7 New trends in e-learning

Current e-learning platforms can be improved as Khoos states (2010) to have an active online learning community; he further states the formation of online communities is the key for e-learning success (Khoos, 2009; Dockery, 2008; Pallof and Pratt, 2007). Gaps in literature exist in factors for mobile learning acceptance and training requirements amongst students in higher education (Cheon et.al, 2012).

The formations of online communities are the main developments on second and third generation e-learning applications. The major difference with third generation is that it attempts to remove the authentication and security feature that creates a small community within an institution's domain. Third generation e-learning tools saw authentication and identity checking as restrictive to learning; hence third generation applications allow open access to anyone to join their learning community. These online applications primarily feature access without authentication. This allows learners to publish and discuss their ideas with an open community, as a result of which their work is criticised, approved and appraised by the wider online audience (Makino, 2007).

Other recent trends in e-learning technology, as stated by Ge Jian (2010) may be that institutions and learning provider's ubiquitous services are overwhelming and are the future. Shu-ying (2010) encourages and argues for the implementation of new evaluation methods such as "learning portfolio, work display and work group discussion" (p408) are the "new ways of thinking", (p.409). Xin Bai (2010) discusses the second generation of e-learning tools where learning is moved from teacher oriented learning to 'student-centred learning", (p.496).

Recent developments in e-learning include podcasts where academics record their lecture or instructions; students are then able to download the podcast into an iPad. Students are able to communicate between themselves and with academics using mobile texting services and phoning the academics with their mobile during a student group session or working individually to clarify any issues. They also have the option of

going to blogs and forums relating to their subject to get instruction, ask questions to clarify issues where an academic often check and answer any relevant queries (see Evans, 2008; Copley, 2007).

2.8 Crowd sourcing

Crowd sourcing is another trend within e-learning literature. It is a term coined to describe a system that enables diverse groups of people to come together to solve various problems. Crowd sourcing is reliant on participation of its members to contribute content. There are various online communities including wikis, blogs and forums where contributors freely offer advice, time, and investment for general benefit to the online masses.

Researchers have stated some of the reasons why online users contribute: for recognition (Kollock and Smith, 1999); the expectation of reciprocity (Bryant et al., 2005); others for sense of community and altruism (Smith, 1992). Oxford dictionary defines Altruism as "selfless concern for the well-being of others". When people believe in an idea, a product, or a service then there is motivation to contribute freely for the good of others. Key examples of some of the success stories are Wikipedia, Usenet, Slide share, YouTube and Facebook. These examples show clearly that online free contribution is a reality and occurs all the time.

Parvanta et al. (2006) states that crowd sourcing is a *'problem-solving approach'* and three forms exist:

1. Crowd funding is a call to raise money. A person or organisation inputs their idea, photos and details of the project on to a web site that has a large membership. Interested members can contribute to the project and the aim is eventually to reach the total fund from the members.

2. Crowd labour is where a request is made to complete a job. The specification of the job is defined by the client then an interested member will be selected to complete the task. The completion of the task is sometimes voluntary and at other times compensated. Examples of crowd labour sourcing are Crowd Flower, Amazon and Mechanical Turk.

3. Crowd research is designed to get insights into a set investigation. For example, in marketing, health insights into patients, customer care and media communications the views of the audience are essential. Examples of crowd research are through voting such as on television programmes where the audience are asked to vote for their favourite member or the best presentation.

A disadvantage of crowd sourcing is the ability to develop a trusted source is needed and to vet everyone defeats the purpose of crowd sourcing, therefore all the crowd sourcing projects assume a certain level of error and operate under the general assumption that people are trustworthy.

Schenk and Guittard (2011) state that certain types of task are more appropriate for crowd sourcing; these tasks should be associated highly with codified knowledge where risks associated with opportunists are low. Less appropriate crowd sourcing jobs would be the type of knowledge that is in low circulation, complex and un-codified, these tasks to outsource to crowd are difficult to process and manage.

Another disadvantage of the crowd sourcing idea is marketing. It takes time, money and resources to have a platform that is well marketed.
The third challenge is to develop a network of volunteers that are contributing. A fourth challenge is to manage the process and sort the posts from what is useful to what is not, which is a time and resource consuming process (Greencard, 2011).

The final challenge of crowd sourcing according to Schenk and Guittard (2011) is clarity of request. The crowd sourcing model depends on a crowd location which is dispersed; therefore if the request is ill defined it will lead to an unsatisfactory result. With employees or a specific job outsourced to an agent this can be dealt with much easier when problems are spotted and revaluation can occur quickly. Within crowd sourcing this is a greater challenge.

2.9 E-learning in Middlesex University London

Middlesex University in London implemented Blackboard system in 2000, recently they have put in a plan to migrate to Moodle. An internal report by Chapman (2012) states that due to funding and costing issues a new direction was sought. The new direction reduced cost and offered value for money at the same time maintaining academic goals and student expectations. Middlesex University considered the increase use of mobile technology by student and staff with the vast number of e-learning applications that are freely available to support learning as a key point in their decision to move to Moodle.

Middlesex University's view is that freely available tools that do not exist within current Blackboard environment are Wikis, podcasting, E-Portfolio, RSS and Web2.0 which are vital tools of learning. This has led to many academics within Middlesex incorporating applications such as Youtube and Twitter in their own personal websites.

Academics within Middlesex say that commercial VLEs such as Blackboard are slow to respond to change and whilst latest tools are freely available, Blackboard has not incorporated them, hence they have decided to upgrade to Moodle
Another Middlesex internal report states that other institutions have made the same decisions, they are Edinburgh Napier University and University of Surrey. The explanation given was that Edinburgh Napier and Surrey chose Moodle because it provided all the functionality Blackboard provides without the additional licence cost. Moodle does not have licence restrictions thereby saving cost and flexibility exist in

association and incorporation with different e-learning application vendors. (Middlesex University, 2012. Scoping report, see Appendix 10).

2.10 Management of e-learning implementation

In order to achieve a smooth running of any technological infrastructure the right skills and support are required (Clegg et al., 2003; Ricket, 2007). Implementing e-learning technology will affect all academics and administration staff, hence full support and co-operation is required from senior management. Implementing e-learning technology demands that working cultures need to reflect the e-learning environment (Murphy, 2003).

Institutions management needs to be aware of the technology adoption process. The stages are innovators, early adopters, early majority, late majority and the laggards. Pressure does not always succeed in persuading academics to adopt technology. They need to understand the technology, the benefits of the e-learning technology and adequate training is required depending on academics' ability and an understanding from the provider of which stage of the adoption process spectrum they are on since the pace of adoption will be varied (Zemsky, 2004; Elgort, 2006).

Burns (2004) explained according to Lewin, that a process of change requires an individual to undergo three stages: the first stage is unfreeze, second stage is change and third stage is refreeze. To achieve a successful change motivation from academic staff is crucial, therefore institutions must explain why e-learning is important; highlight the benefits of the system to academics and students and the financial benefits or the reward it will bring to the institution.

Luckin et al. (2006) wrote a paper on how e-learning was introduced at University of Sussex, first by stealth and later as an accepted tool to aid and support learning. One of the major themes of the paper is the perception of senior academics as being disruptive and distracting to the Universities activities', a 'major obstacle to e-learning

was disinterest bordering on hostility from some of the senior management team' (p.321). The initiators of the e-learning technology in Sussex knew the importance of an information campaign to win the hearts and mind of staff, so one of the tactics used to disseminate information was by using simple scenarios on the benefits of using e-learning and ways teachers and students can use the technology with simplicity using cartoon images and various dialogues.

Dublin (2004) points out that in order to have a successful e-learning implementation, it is necessary to have a communication plan and a marketing plan. Each plan informs the institution's vision of what to expect, how it will help them, what processes are involved and the benefits it will bring. He argues that if information is not passed on correctly, the right support will not be present, and the desired results will not be seen, and further states that "adults have a very low tolerance to change, technology and processes that don't work' in their eyes", p.293.

Clegg et al. (2003, p.49) discusses flexibility of the students brought on by e-learning technology where the dynamics are changing in higher education as students have other commitments such as work and family. With the new found flexibility, student numbers are increasing. This is leading to academics' time being difficult to manage as they have to support this flexible learning along with other work staffs are expected to carry out such as research, conformity to QAA, REF findings and applying for new funding.

2.11 Conclusion

The literature review has identified a gap in existing research regarding understanding the academics' perspective of e-learning. There are many areas within this gap in the research that give cause for concern; they have been grouped as challenges facing higher education institutions. The six broad categories are: learning style and cultural challenges, pedagogical e-learning challenges, technological challenges, technical training challenges, time management and health challenges.

There is a debate amongst researchers as to whether e-learning saves time or increases the workload and working hours of academics. All the challenges appear to have a permanent relation to each other; if one of the challenges is not faced adequately or are deficient then the overall delivery and learning will have a deficiency. If the correct training is not provided then academics can waste more time than necessary in trying to understand and use the system. Their interactions with students will therefore not be as effective as they could be, due to both their limited use of the system, and the time it may take them to complete each task. Additionally, other disadvantages of e-learning such as the complexity of the learner and the challenge that e-learning thereby presents, also need to be understood and where possible, e-learning needs to be constructed in a fashion that allows academics to interact more effectively.

All of the six challenges have one factor in common: time. Each challenge either has an impact on academics' time, or requires some of the academics time to be overcome. For example, the challenge of different student learning styles takes academics time to produce teaching material which best suits the different students. There is a pedagogical challenge to the construction of materials for e-learning systems, which requires time from the academics day. Extensive skills are required to develop these, and without training, the materials developed could be inadequate for student's needs. This training is the third challenge which requires academics time, as does the technical challenge, as e-learning systems sometimes have technical issues. All of these impacts on the academics' workload, which can cause health issues in the long run.

The literature review has shown that the field of e-learning, from the perspectives of academics, needs to be better understood. By using this research study to better understand the challenges facing academics, a solution can be create which improves academics interactions with students. From the literature review, it has been shown that any improvements to e-learning must aim to try not to increase the academics' workload, and where possible, try to reduce the amount of time that the academics spend on online activity.

As well as focusing on understanding the challenges of e-learning for academics, the literature review also looked at human resources and the crowd source model as a potential area where help can relieve academics of their workload. Human resources can aid academics in the sense of providing clear policies and guideline to recognise, reward and remunerate academics for extra work. The crowd sourcing model can be utilised to solve academic workload by outsourcing some of the work so it relieves academics thereby saving time and work load. Outsourcing some of the academics work is an interesting idea, and is a concept which will be considered in more detail in the results and findings chapter.

The next chapter will identify the methods used to explore academics' perspective and describe steps that were taken to conduct this research.

Chapter 3 Methodology

3.1 Introduction

As discussed in the literature review chapter, many academics face challenges in the use of e-learning tools, including those relating to learning style, cultural challenges, pedagogical e-learning challenges, technological challenges, technical training challenges, time management and health challenges.

The main purpose of this chapter is to describe and discuss the overall methodology that was used to conduct this research; this will include describing the research design, data collection methods, and techniques used in the analysis of the data.

This chapter describes and justifies the research approach taken to investigate the challenges of e-learning use raised by academics, and the development of a manageable solution. Finally, it will critically reflect on issues of data validity, reliability and ethical issues as they have arisen in the research process. Before this, the chapter will restate the aims and objectives of the research as well as clarify the research question.

3.2 Research Aim

The title of this research project is managing interactions in the e-Learning environment: technological support for academic staff. The aim of this research is to explore the extent to which online learning applications have increased academic workload by requiring academics to spend time supporting online learning. Thus the appropriate research design, methods, and analysis techniques have been identified and used to ensure the success of the research.

3.3 Research Philosophy: Ontology and Epistemology

Paradigms are ways of thought and there has been much debate as to the best theoretical approach to guide research. Differences in ontology and epistemology will determine the research method an individual researcher selects. Researchers adopting a positivist approach to the social world will treat data, objects, experiences or beliefs as being objective, real and external to the individual. Positivistic research traditions use methods such as surveys and controlled experiments. Other researchers preferring a more subjectivist approach view the world as part of the self, as subjective, and open to interpretation. These researchers tend to choose methods such as participation observation and qualitative interviewing (Bryman and Bell, 2007; Creswell, 2012).

Constructivism is the idea that the world that exists is only real in as much as we interpret it. This would be considered constructionism on the ontological scale; constructionism is also referred as interpretivism (Denzin and Lincoln, 2000; Mertens, 2009; Creswell, 2012). Interpretivism is concerned with understanding human action as subjectively meaningful. A positivist perspective, on the other hand, is traditionally found amongst natural science researchers (Crotty, 1999).

The majority of qualitative researchers tend to use one of three paradigms as stated by Guba (1990), namely: post positivism, critical theory or interpretivism paradigms, to guide their research.

3.3.1 Interpretivism: Philosophy of this research

This study seeks to understand issues of concern to academics, and understands that not all academics have the same views; they have varied experiences and motives behind what they see as a problem. This research will examine how roles have changed due to the emergence of e-learning technology, and the new measures needed to be taken to address the support required.

This research study focuses on academics sharing their experiences of using e-learning technology to support teaching and learning. Therefore it can be argued that it takes an interpretivist approach because it represents individual's views, understanding and interpretation of their experiences of the phenomenon of using e-learning technology to support teaching and learning in UK higher education institutions. In addition, given that it generates qualitative data from interviews it opens the data for further interpretation to make sense of the responses.

There have been a number of criticisms of interpretivism over the years such as the argument that knowledge gathered by interpretivist methods is empirically untestable, as it is one researchers view against another (Weber, 1949). Also, it can be argued that it is impossible to be value-neutral; however as long as interpretivists do their best to be self-reflective, biases can be minimised. Despite the criticisms, other theories, such as positivism, are not useful in understanding social action and individuals' views. Therefore an interpretivist philosophical approach for this study is the most suitable. Qualitative research methodology is used by interpretivists, which will now be discussed.

3.4 Qualitative Study

To achieve the aim of this project, qualitative methodology was the appropriate approach to examine the issues underpinning the research. This was an exploratory exercise where academics' experiences were sought to be understood, and the method allowed for the collection of sufficiently rich and relevant data to achieve the research aim; data that is currently unavailable in the existing literature on e-learning technology.

This research is guided by an interpretive epistemology, and interpretive research tends "to be qualitative studies" (Willis, 2002). It has been said that qualitative research is one that "examines phenomenon primarily through words and tends to focus on dynamics, meaning and context" (Weiss, 1998, p335). This approach differs from quantitative methods, which seek to develop knowledge about a phenomenon through the use of

numerical measures and statistical analysis. Since my objective is to discover academics' perspectives on the use of e-learning technology, qualitative methods meet the necessary criterion as they are used to find meanings and explanation, which cannot be said of quantitative methods (Denzin and Lincoln, 2003).

This research intended to explore the technological support required by academic staff, the challenges academics are facing, and why and how to overcome these challenges to maintain an online presence by mitigating a negative effect on an individual academic. If a quantitative methodology was used as the main method of research, questions such as how many challenges or how much the challenges are costing academics would have been asked, which neither meet the aim nor the objectives. However, whilst qualitative methods were used as the main design of the research methodology they were supported by quantitative data through the analysis of participant transaction logs, the quantitative data will be discussed further in section 3.5.

There are various techniques within qualitative research, such as interviews, observations and narrative questionnaires that are used to gather data. The interview method is ideal for identifying types of existing problems and the possible changes needed to help academics to fulfil their role. This is because interview techniques are useful in getting in-depth narrative data on the varied experiences, opinions and feeling related to the impact of e-learning technology (O'Muircheartaigh and Campanelli, 1999; Alreck and Settle, 1995). The interview method provides for understanding opinions and feelings (Arksey and Knight, 1999).

For this research, qualitative interviews are the appropriate technique since they are more suitable for exploratory research. Surveys do not meet requirement of this research as the format of the survey is usually moulded to a pre-conceived standard and are not appropriate for exploratory research. The questions were complex, long and open-ended.

According to Arksey and Knight (1999), interviews can be structured, semi-structured or unstructured. Structured interviews are planned with specific questions to get relevant data. Unstructured interviews, on the other hand, develop out of a theme or an idea of what will be discussed and from the discussion the interviewer will see which areas to concentrate on. Semi-structured interviews fall in-between, where there is a plan of questions but always the interviewer is ready to explore areas where interesting ideas and information can come about; hence semi-structured best fits this research. Since this is exploratory research, having completely structured questions is not suitable, on the other hand, there are specific questions which have to be asked of academics and this will also not suit unstructured interviews, as unstructured interviews do not start with predetermined questions. Hence semi-structured interviews are appropriate for this research. This research consisted of two rounds of interviews, the first round of interviews was semi-structured and the second round of interviews were structured after the prototype demonstration and trial.

Maxwell (2005) states: "If you are talking with one kind of informant, you need to consider why this kind of informant is important, and from there which other people should be interviewed". This statement is very relevant as after interviewing a few candidates, enough information was gained for me to realise how many potential candidates would be required to be interviewed in order to have all the necessary information needed to answer the research question. After interviewing twelve candidates sufficient information was gathered to analyse, draw preliminary conclusions and consider whether further data was required to complete the research.

During the interviews questions were phrased differently to the way that they were written in the script. Questions were asked earlier or later in the interview depending on how the interview was flowing, and on occasions a question was deemed not appropriate to ask. However the end result produced the information needed to meet the objectives set. Also interviewees' answers are not predictable, and sometimes they answered questions yet unasked or provided answers that provoked additional questions. This is supported by Weiss (1994) where he discusses mistakes made in

interviews. He talks about a question that can be asked awkwardly by an interviewer to bring about useful information, and that what is not acceptable is that researchers can fail to get the correct information or the information that is required. This is not referring to asking questions to gain predetermined answers, rather an interviewer can go off from his written script where appropriate and delve into matters to extract or gain an insight about a particular point that is beneficial to the research. By deviating from a planned script, sometimes questions are asked awkwardly, which should not matter as long as the point is understood by the interviewee and information is gained.

3.5 Quantitative analysis

Quantitative analysis concerns counting attributes (Abeyasekera, 2005). Quantitative data can be gathered from interviews, questionnaires, observation, transaction logs, website activity and documentary research. To support this research, twenty four participant transaction logs were collected. Peters (1993: 38) defined transaction logs as "the study of electronically recorded interactions between online information retrieval systems and the persons who search for the information found in those systems".

The transaction logs were used as a source of data to compare the information gathered on time spent on the Blackboard system from the first phase qualitative interviews. The first phase of interviews highlighted the difficult issues academics faced; however interviews were limited, therefore gaining transaction logs to support the academics interviews was sought.

The more transaction logs that were analysed, the stronger the triangulation of the research, however it was only possible to gain access to 24 logs. The transaction logs contained an accurate record of academic usage of the Blackboard system. The interviewee could have poorly reflected on their exact online usage in the interview; the transaction log therefore clarified the hours spent on blackboard system, section 3.7.2 discusses further details on the transaction logs.

3.6 Sampling

The aim was to sample a smaller group of the population in such a way that the data collected should be representative of the total population under study. Hence the sampling of the candidates was based on purposive sampling. This sampling method identifies participants based on research purpose and is used in qualitative research (Miles and Huberman, 1994). This method is very similar to criterion-based selection (Maxwell, 2005) where candidates are found according to a particular selection criterion by design in order gain the information required. The participants were selected by recommendation; each interviewee had to be a specific person, who holds a particular position at a higher education establishment and teaches particular subjects. The subject areas of interest in this investigation were health and social sciences, language and arts, computing, engineering and sciences.

In selecting participants for this research project, a wide range of factors and considerations were taken into account to ensure that the sample was credible, balanced and representative of the main population. The population was academics in UK higher education institutions that hold either a full-time or part-time professional contract and have some level of experience with technology in supporting teaching. The characteristics identified in this population were the academic's discipline/school orientation, and level of engagement with technology.

Strenuous efforts were made to ensure that the sample participants reflected the characteristics of the overall population; however, the main factor that significantly influenced the selection of participants was their willingness to participate in the research.

Invitations to participants were based on their profession as academics within UK higher education institutions, holding a part-time or full-time post. Equal numbers of academics were chosen from subject areas; three participants from Health and Social Sciences, three participants from Language and Arts, three participants from

Computing, and three participants from Engineering and Sciences. This gave some level of balance in the participants selected for interviewing. Balance was also ensured regarding the type of technology use. During the selection stage, academics were categorised into three types by the researcher; technology avoiders, technology friendly academics and heavy users. Participants from all three categories took part in the research, which ensured that the results were not biased towards a particular set of academics with a specific technology usage type.

No selection criterions were made of their experience of using e-learning technology. They did not have to use e-learning technology to be a participant but had to be in an environment where e-learning technology was present and they had to be aware of it so they could contribute to this research.

The participants were found using the researcher's personal contact with academics at different universities which helped to secure interviews according to the above conditions.

The aim was to interview as many academics as possible until enough data was collected to answer the research question: how to better manage online presence in the e-learning environment by developing an application tool to support academic staff. The analysis after the first set of data collection answered the research questions and also its aim: to explore the extent to which online learning portals are compelling academic staff to maintain a quasi-permanent online presence.

3.7 Data Collection Process

This research followed a three-phase approach to data collection. The first phase of the initial data collection was semi-structured interviews to explore the challenges faced by academics in the use of e-learning technology and to analyse data that led to the development of the prototype solution.

The second phase of data collection was the structured interviews; these occurred after the development of the prototype, where the prototype was taken to the field to gain feedback from academics on whether and how it would aid them in their role.

The last phase of data collection was transaction logs showing academic's time spent using e-learning technology.

3.7.1 First phase data collection: Qualitative semi-structured interviews

The interviews for the first phase of data collection were semi-structured and exploratory, and focused on the experiences of academics in the use of e-learning technology, including the challenges they faced.

A trial interview was conducted with my supervisor and the interview process was approved. This served as the ethics approval, there after the interviews were carried out with participants.

For the preparation of the interviews two scripts were designed; one script to explain the purpose of the interview and to assure confidentiality, see Appendix 1. The second script contains questions for the participants, see Appendix 2.

The interviews were conducted face to face at a location chosen by the participant. Most were in the participants offices, one in a university restaurant and one in a quiet coffee house and few were over the phone. All the interviews were recorded using an MP3 player. Notes were taken using pen and paper of any important information. The field notes were useful, serving as a method of quick immediate analysis. After each of the interviews, the notes served to identify key points and patterns within the data.

The qualitative semi-structured interviews consisted of six main questions. Depending on the answers given, further sub-questions were asked to elicit additional information

or initiate a discussion. The questions asked in the interviews were designed to gather data according to the aims and objectives of this research.

What follows is a description of the interview questions asked, the justification for asking them and a discussion of they were analysed:

1. What kind of software technology, e-learning Systems do you use to teach? E.g. WebCT, Blackboard.

This question identified the most common e-learning system used by institutions and academics who participated in the study. This data helped to identify the model the prototype would be based on. This question had to be addressed as the academics' views of the e-learning experience may be derived based on the tool they are using.

2. What do you think are the benefits of using e-learning technology for instructional purposes and what do you think are the drawbacks of e-learning?

This question asked about the benefits and drawbacks of the use of e-technology in teaching; this allowed the identification of many of the problematic issues surrounding e-learning as well as the positive aspects which academics recognise in the technology. When academics stated their problems and difficulties, it created the opportunity to ask if they have a solution in mind or recommendation for the institutions or government that may help overcome these difficulties. This question prompted discussions of their feelings towards the technology, about their institution, how they have implemented the technology and if there is a viable solution to the problems they face.

3. How much time do you spend with technology for teaching (e-learning system)?

The aim of this research is to find and verify if academics were actually spending too much time, in their opinion, with e-learning technology. This question explored the time issues and matched them against the literature to find out whether this is the case.

4. Do you think your job role has changed and is changing often due to the e-learning technology?

This question relates to changes in academics' job roles; it identified the effects of e-learning technology. By identifying some of the changes, it allowed for the investigation into a technical solution, which can be incorporated into the e-learning system. When academics identified problems and difficulties, this gave the researcher the opportunity to ask whether a solution exists or if they knew anything that would help them overcome the problem. That was crucial as it is the academic's perspective so a solution or a suggestion coming from the academic was worthwhile investigating.

5. Please describe the types of training you get to use the e-learning Systems?

The fifth question asked about training on the e-learning system. It is an important area of the research aim as the amount of training received to use the technology determines to an extent the type of effects it had on teaching staff. The data provided necessary information on problems in relation to training and whether the proposed solution was to be technical or related to training needs.

6. Does using e-learning technology cause you to become frustrated?

The sixth question related to the welfare of the academic staff. This question discovered if there was a health concern and further identified effects of e-learning. It can be argued that frustration or dissatisfaction are not a health concern; however this question helped to explore the comments, reaction and initiate discussion around e-learning technology.

The first phase of interviews was analysed to find what academics liked and disliked about e-learning and the results are listed in sections 4.2 and 4.3. The data was analysed to find the key findings such as an increase in workload and working hours,

issues with training, complexity of e-learning and the academics role being affected due to workload. The analysis process extracted what academics would like or the type of support that would help them; this is inserted in section 4.3 as the academics' wish list.

The disadvantages were studied and for some academics their work hours had increased which was supported by literature in section 2.4 highlighting the time management challenge. The wish list comprised many suggestions as to how academics could be supported; most of the suggestions were management related such as adequate training and better technical support to be provided. Others involved defining clear policies and some technical suggestions to help academics in their role as teachers.

The solution that helped with the time management challenge was the Knowledge-Base Forum solution. The academics did not specify the how the technical suggestions were to be developed or operated but rather they gave an idea regarding the creation of an application that would help with finding content to support their research and teaching, which would help them in their role.

3.7.2 Second phase: Transactions log

To support the interviews, participant transaction logs from Blackboard system were collected as discussed in section 3.5. The logs were collected from 24 academics, four academics from each of the following schools: Law; Technology and Science; Health and Education; Media and Performing Arts and Business School (see Appendix 5, a sample of transaction logs). Middlesex University was chosen as the institution from which the logs should be collected because of easy access; other institutions were approached but they were not forthcoming with the information. The sample was credible, balanced and representative of the main departments.

Microsoft Excel was used to analyse the transaction log data. Peters (1993) stated researchers often use transaction analysis to find utilisation of a system by users which

can be conducted within a simple Excel spreadsheet or using SPSS analysis software. The transaction log in this research refers to the academics Blackboard logs. The logs consist of the name of academic, their department, date and time for which the academic utilised the Blackboard system.

Transaction logs are a good source of data to support actual working hours. However a weakness in the data is that academics are working to support their teaching activity by using other e-learning technologies such as YouTube, discussion forums, emails, chats, and specialised analysis and training software which will not be logged. This hypothesis was confirmed from the results of the first phase of the interviews: academic stated they use other e-learning systems and applications to support their teaching.

The Blackboard transaction logs only show the log in and log out time of Blackboard system. Therefore the transaction logs do not truly reflect the exact working hours online, but an assumption is that academics time spent on e-learning is more than what the logs show. Additionally, the transaction logs were collected for a week from 22-Feb-14 to 28-Feb-2014, that week is not the busiest period in the academic schedule. The busiest time would be beginning of semester in September and January so an assumption is that the logs would show less usage than if the data was retrieved during a busier period. The data collection date 22-Feb-14 to 22-Feb-14 fitted in with the research timetable and no distortion of data occurred.

3.7.3 Third phase data collection

The third phase of data collection took place after exploring the experiences surrounding academics' use of e-learning technology and analysis of the challenges academics faced in using this technology. The prototype solution was developed by this stage, this enabled the research to move on to trialling the prototype solution.

The purpose of the second round of interviews was to confirm if the prototype designed helped academics in their role. The second round of interviews was structured, as the

prime objective was to know from the academics if the prototype solution was helpful to them or not.

Before interviewing participants, a prior session and briefing was given to the participants that showed them the prototype application, how it worked and explained the reasons for its development. After academics practised operating the prototype application they chose the location, time and date of the interview.

The interview was kept simple by only asking four questions:

1. Will it help you in your role by reducing time spent on on-line activities?

A disadvantage of e-learning stated by academics during the first set of interviews was the time factor; it takes time learning how to use new systems and therefore adds to their work load. The literature review also indicated that academic workload had increased due to an increase in time and effort associated with the introduction of e-learning. Knowledge-Base Forum should help in the process of creating and gaining materials thereby reducing time spent online. Therefore this question helps to understand Knowledge-Base Forum's ability to develop material thereby helping an academic.

Objective two stated that the research should find a requirement to address the change in academics role. Since increase in time spent online was highlighted as a critical disadvantage caused by an online learning system, this solution was developed to address this aim. If academics were to answer question 1 positively then this research would have succeeded in its aims and objectives.

2. Is the Knowledge-Base Forum useful?

The first set of interviews showed technology avoiders do not like e-learning systems, so this simple question should ascertain if they thought that Knowledge-Base Forum is

beneficial. The analysis of this question will also identify useful features that could be added to the system, or highlight any shortcomings.

3. Is it easy to use?

Literature and the first set of interviews showed that some academics believed that e-learning systems are complex, therefore there is negativity about these systems and some academics avoid them. In order for Knowledge-Base Forum to succeed it had to be easy to use and this has to be confirmed from academics before developing the prototype any further.

4. Would you recommend the forum to your friends, colleagues, other academics or associates?

Academics' willingness to recommend the system to their colleagues is an indication that they like Knowledge-Base Forum. If answers are positive then the whole application will be seen as positive and more likely to be a success.

For the preparation of this round of interviews, as during the first round of interviews, two scripts were prepared for each of the interviews. The first was to explain the purpose of the interview and to assure confidentiality. The second script had the questions to ask the participants.

The interviews took place in the participants' offices. All interviews were recorded using an MP3 player and field notes were taken.

3.8 Knowledge-Base Forum: A Prototype Approach

The prototype application developed for this research study is named Knowledge-Base Forum. It was developed from scratch using Drupal 7 software and required extensive configuration. Drupal is an open source content management application that allows configuration to suit businesses or personal needs. Drupal's strength is in building forums and content management applications. It has a front end that enables development using PHP and a background database MySQL to hold data. Drupal 7 has vast numbers of ready-made modules that are freely contributed by a large online community. This allows it to perform various functions without the required PHP coding and allows extension to the features by various configuration settings. Chapter five will discuss the framework of this prototype and the configuration details are listed in Appendix 11.

To develop and test Knowledge-Base Forum, a prototype development paradigm had been taken. Popular approaches to software development include linear strategy, the plug in strategy and the prototype strategy (Bally and Brittan, 1977).

Bally and Brittan (1977) put forward eleven steps of the linear approach:

1. Conception
2. Study the problem
3. Requirements
4. Analysis
5. Design
6. Implementation
7. Testing
8. User acceptance
9. Maintenance
10. Audit
11. Modification

The Plug-in strategy is similar to the linear method, where steps 1 to 4 are carried out in the same sequence but steps 5 to 11 are not performed in linear but done according to the need of the design; however most importantly all the steps are carried out, making it similar to the linear approach.

The prototype strategy is a simplified implementation of the software then tests are carried out for a revised requirement. After that the prototype is adjusted or redeveloped; this process continues until a satisfactory system is developed. The prototype strategy may not go through any of the linear steps rather once a problem has been studied and requirement is built it can be moved into the development phase, tested, and modified until the system meets expectations.

Numann and Jenkins (1982: p.30) define prototype as a 'system that captures the essential features of a later system'. A prototype is a model that is intentionally incomplete, with the aim to gain feedback from its intended audience so it can be modified, corrected and expanded until it is perfected. The prototyping process is made up of four stages; first to identify the basic requirement, second to develop a working version, third to implement and test the version and the fourth step is to revise or amend the prototype. The third and fourth steps are repeated until the process is complete (Numann and Jenkins, 1982).

There is no right or wrong approach to software development; all the approaches work well depending on the situation and have been used throughout the industry. Bally and Brittan (1977) suggest the selection of the strategy should be decided based on experience of a similar system. For example, when an organisation has experience of similar system then the linier strategy works well. Otherwise the prototype strategy works better.

Developing the Knowledge-Base Forum is not aimed at getting the system to become perfect but rather to prove the concept that academics could benefit from gaining

research contributions from a pool of experts. Development using Drupal 7 and configuring a bidding system to provide content rather than selling goods or services is a novel concept for the researcher therefore the prototype model was the most suitable for this task.

Development of the Knowledge-Base Forum does not follow the waterfall paradigm but had adopted the four stage prototyping model as described by Numann and Jenkins (1982). The first stage was fulfilled when interviewing to gain academics suggestions and wish list. This was the initial concept and study of the problem. During the second stage the prototype Knowledge-Base Forum was developed, in third stage the prototype application was piloted with academics and lastly the fourth stage took recommendations and lessons learnt for the revisions to be implemented for the next phase of development: the beta version.

3.8.1 Demonstration and trial of the Knowledge-Base Forum prototype

Four academics were invited to view a demonstration of the prototype and then trial the prototype. The purpose was for them to learn how to operate the Knowledge-Base Forum, then to use and check its functionality. Feedback was recorded so that recommendations could be taken forward for further improvements for the beta version of development. The selected participants had five days of access to the Knowledge-Base Forum for their trial. The feedback came in the form of interviews which discussed with academics their thoughts on the prototype of Knowledge-Base Forum.

Knowledge-Base Forum is a prototype version referring to the first version of the development; it has a few functions that were available to test:

1. To request content
2. The bidding process
3. Delivery of content by contributors
4. Search published content

The purpose of this prototype was to see the reaction of the academics and provide a functional base to critique and add recommendations that would enhance the prototype application in later developments if this study proves successful. The second stage would be to develop a beta version of the prototype where all the functionality is perfected and a greater number of participants test the application. This research study will not contain the development of the beta version of the Knowledge–Base Forum, it will instead construct a list of recommendations in the further works section, chapter 6, which will be applicable to the Beta version.

The trial of Knowledge-Base Forum will be extensively discussed in chapter 5.

3.9 Data Validity

Maxwell (2004: p.124) states that there are "two broad types of threat to validity that are often raised in relation to qualitative studies: research bias and there are the effects of the research on the individuals studied, often called reactivity". Similar statements have been made by Miles & Huberman (1994).

Researcher bias is when data, solutions or information is selected based on the researcher's existing beliefs or understanding. To check for bias, Maxwell has put forward eight strategies that help to develop data validity. Three of these techniques are useful in this study:

1. To gather "rich" data (Maxwell, 2004, p.110), he suggests interviews should be longer, more intensive, and more detailed in order to produce richer information.

2. Searching for discrepant evidence and negative case. This process involves looking out for discrepancies, unexpected data, or data that did not match overall findings.

3. Triangulation should be used which is a process to reduce bias, misunderstanding and misrepresentation.

This research took three steps to meet this strategy. The first part of the triangulation process in this research was to interview academics from different institutions. The second source of triangulation was evidence from Middlesex University participant transaction logs. Third, structured interviews took place with academics after a demonstration and trial of the prototype. This added richness to the collection of data in this research study.

To reduce any bias and get a correct understanding, the findings have been triangulated with data from different sources as mentioned in the above paragraph. Maxwell states "this strategy reduces biases or limitation of a specific source or method, and allows you to gain a broader and more secure understanding of the issues you are investigating" (2004, p.94).

3.10 Ethical Issues

It was possible that academics were uncomfortable in expressing their true opinions about e-learning technology, particularly in relation to how it is used in their institutions and the challenges they may have faced. For this reason, academics were reassured that their participation was confidential and their responses would remain anonymous. This was discussed with each participant before the interviews to ensure that they were comfortable with the process. For this thesis, an anonymous pseudonym will be used for each candidate.

Prior to each of the interviews an explanation was given to the participants for the reason behind the interview. The privacy of the interview was also explained to them, as well as the interview content, findings and results being only used for this research. This was re-iterated at the end of every interview.

Weiss (1994) and Creswell (1998) recommend trial interviewing. A trial interview was conducted with my supervisor to confirm the sequencing of questions, to test the questions, test the wording of the questions, to become familiar with the schedule and to become prepared for the real interviews. The trial interview helped to clarify the interview questions, change order of the questions so the questions flowed correctly and highlighted the importance of privacy, anonymity and confidentiality. Conducting the trial interview with my supervisor additionally served as ethics approval.

3.11 Analysis of interview data

All data collected through the interviews was analysed via an inductive qualitative process as discussed by Thomas (2006) and Braun and Clarke (2006). Thomas (2006) describes the analysis process involves:

1. Reading data
2. Categorising
3. Data reduction by constantly comparing data
4. Revising codes
5. Continued revision and refinement of codes in order to draw conclusions

Thomas (2006) further describes that data collection and data analysis is a simultaneous process in inductive research. Throughout the data analysis process, themes to be identified and then categorised using codes. This to allow for the codes to be reviewed repeatedly and continually updated as themes and classification emerges.

Braun and Clarke (2006) listed six steps in using thematic analysis, these steps were followed for this research study:

1. Review raw data

All interviews were recorded and then transcribed for analysis. For each interview, the recording was listened to and notes made on important points relevant to the research.

During the interviews important information was noted down immediately. The field notes were useful, as they served as quick immediate analysis after the interview was over, and helped to identify the key points and similar patterns across all the interviews. This step involved the process of reading data and transcribing to become familiar with the data.

2. Discovering codes

After getting familiar with the data, the next step was to list what was of interest in the data and produce initial codes. This involved focusing on the core data by filtering it, and numbering and coding the data to make it easy to understand and compare.

Texts of interest were highlighted and descriptive words or short sentences were used as code. Within this stage coding as many potential patterns and data of interest as possible was carried out. The text in the raw data was highlighted with a descriptive word which can serve as the code; this demonstrates the coding process.

3. Finding themes

The interview data was revisited multiple times to explore themes and ideas that were emerging from the data, primarily to identify patterns between what different academics were saying.

The prime focus at this stage was to identify broader themes by looking at the codes, to discover any implicit relationship that explains various codes which are at a more abstract level. Relationships and patterns that were emerging from the data were searched for, and the research objectives were concentrated on to narrow down significant themes.

The iterative analysis continued until it was not possible to find new categories or themes that added value to the research question.

4. Reviewing themes

Having categorised the codes into broader categories in the previous step, this next step involved revisiting the aims and objectives to identify themes which are adding value to the research question and removing those that did not contribute to the investigation.

This step focused on the many challenges faced by academics in the context of the research aims and objectives. The qualitative analysis software NVIVO was used to help in the coding data analysis. The following steps were taken to analyse the data using the NVIVO tool:

1. Defining the sample; the project sample was made up of respondents who were the interviewees, and their sample characteristics which were academics from UK higher education institutions, which institution they work for, their level of engagement with technology and their subject speciality.

2. Once the sample was defined, the research data was imported. The research data consisted of the recordings of the interviews that were transcribed. The categories were inserted that were relevant to the research aim to help organise the data and keep it in a secure and central file for processing.

3. The next step was to create the analysis framework that emerged as the result of categorising the content. This helped to analyse and interpret raw data according to the research objectives.

4. Data was collected during every interview and imported; adding of commentaries and notes against samples and headings were inserted. In the analysis framework, the data was categorised under relevant headings, which helped to query the data according to the research objectives.

5. After adding commentaries, notes, and the analysis framework, the mapping function was used to map ideas to visually represent and record thoughts, linking related ideas to consolidate the findings.

The analysis identified challenges faced by academics in the use of e-learning technology, as well as solutions to these problems. They were compiled into a list of suggestions which are presented in chapter four, section three titled Academics' wish list.

5. Defining and naming the themes

In this stage, further refinement of the themes was carried out to show what is interesting about the themes that relate to this research. Once the themes had been categorised at the most abstract level, the codes then reflected the answer to the research question. This analysis is listed in chapter four, where it is explained, and related to the research objectives.

6. Final report

Whilst writing the final report in chapter four, a final analysis was carried out to make sure the codes made sense, it was logical and helped to answer the research objectives.

Analysis was carried out to narrow this list down to a feasible solution to implement. During this process all known solutions that were in existence and the solutions that were not possible to undertake due to various limitations, including technical limitations

or because they were outside the research scope, were filtered out. At the end of the filtering process three possible solutions were identified. Then a third round of analysis was carried out to identify a single solution that could be developed.

After that a framework for the technical solution was written and implemented in the prototype model. After the development of the prototype, four academics were selected to test the prototype to gain feedback to confirm if the prototype solution could help academics in their role.

Academics were selected from Middlesex University London to trial the prototype. The academics were chosen from different departments: Health and Social Science, English Language, Computing and Engineering, and Work based learning. The sample of participants included a mixture of expertise from computing and technical experts to novice users.

3.12 Conclusion

The research was carried out in three phases. The first phase was to investigate e-learning from an academic perspective and a qualitative method was chosen to investigate and explore the issue. It is an inductive process and the thematic analysis method was chosen to structure and analyse the data collected from the first phase of semi-structured interviews.

The second phase was the analysis of the first phase of interviews, enabling the development of the prototype for demonstration. Transaction logs of 24 academics were also collected in this stage and were analysed to support the first phase of interviews.

The third phase of the research was the demonstration and trial of the Knowledge-Base prototype which were followed by structured interviews with academics to confirm first phase interview results.

In the next chapter the data collection from both sets of interviews and the transactions logs will be critically analysed, whilst taking into consideration the findings from the literature review. A discussion will follow identifying the Knowledge-Base Forum as the tool to aid academics in their role.

Chapter 4 Findings and Analysis

4.1 Introduction

The literature review pointed to six areas of concern where gaps in e-learning research exist:

1. Learning style and cultural challenges

A current challenge for academics in an e-learning environment is to understand the different learning styles of different students. The traditional method of learning may not be adequate in the modern day classroom where e-learning technology is playing a major role in the delivery of education. In principal the key to understanding the student needs is to understand the diversity in the virtual class (Folley, 2010; Donahue and Glodstein, 2013).

2. Pedagogical e-learning challenges

As e-learning is currently widespread, academics who are not equipped technically to handle development of materials and delivering online modules are hampering progress; they require extensive skills development (Ellis, O' Reilly and Debreceny, 1998).

3. Technological challenges

Technical support to academics is insufficient in comparison to the desire for learning success with technology. The pursuit of e-learning by institutions is met with inadequate investment in infrastructure and technology support (Reeder et al., 2004).

4. Technical training challenges

According to Taylor (2002) academics are only good as much as they can adapt to the new technology, and this is a challenge for most academics. The is not always the technical challenge but also issues with time management, busy schedules and the difficulty in adapting some content which does not fit well in an e-learning environment.

5. Time Management

A few researchers have stated that academics should always maintain a vigorous presence on online discussion boards so they can control discussion, provide answers and feedback so students do not disengage from the course, for some academics this leads to a permanent online presence (Vonderwall *et al.*, 2007; Mayes *et al.*, 2011; Nandi *et al.*, 2012).

6. Health challenges

Since pressure is increasing on academic staff to incorporate technology along with the notion of 24 hour support on top of their burdened duties, it is possible these changes will lead to a breaking point, affecting the quality of education thus destroying the credibility of institutions which has been built up over centuries. If educational establishments do not create the correct nurturing ground for their staff then no doubt it will effect cooperation and communication that will eventually lead to reduced job satisfaction and stress (Zeffane and McLoughlin, 2006).

Based on the above concerns, 12 interviews with UK academics were conducted to confirm and explore these areas. The interview script was based on six key questions. In this chapter, the results from each question will be reported, analysed and then a discussion will follow on how the identification of a technical solution was reached. Further, a collection of Blackboard logs were collected from twenty four academics to

show their working hours whilst interacting with an e-learning system. The data will be critically analysed.

The outcome of this chapter led to the creation of the framework and key concepts that the prototype was based on. The aim of the prototype development was to develop a piece of software that could enable academic staff to effectively manage their interactions, without creating excessive academic workload.

4.2 First Interview Results and Analysis

The interview results were analysed using a thematic analysis method as stated in chapter three. The interviews were recorded and notes taken simultaneously. The interview data was revisited multiple times to explore and categorise themes. The iterative analysis continued until it was not possible to find new categories. The data collected from the interviews (see Appendix 4) and document associated with how analysis was carried out can be found in appendix 6.

The following describes the key themes that were identified to answer the research aims:

4.2.1 Interviewees' Technologies

Of those that took part in the first set of interviews, five academics used Blackboard, one used WebCT, and five used 'other software' to support learning. One academic did not use any e-learning technology for teaching.

The technologies used by all interviewees to support learning were: OHP, PowerPoint presentation, Microsoft Office suite, internet web sites and electronic email to prepare and to communicate lesson plans.

Data gathered from the interviews suggested that the academics saw e-learning platforms as a tool to do a job well, and the specific one used made no difference to them. However, all academics encouraged their students to use the internet to do some research, and they encouraged students to use the email system. One academic pointed out that students were encouraged to use the email system specifically to pass on interesting materials relating to their course to other students.

The most commonly used e-learning system in the market, both according to the literature review and to the academics interviewed for this study, was Blackboard. Academics did not distinguish the different components that are put together to make up the e-learning system. They see the Blackboard system, email system, internet web pages, the multimedia tools that are used to record images and videos, and even Microsoft Office, PowerPoint and other applications used for teaching, as the same entity, i.e. for academics all these entities make up the e-learning system.

4.2.2 Advantages and Disadvantages of e-learning technology

List 4.1 shows eleven advantages and list 4.2 presents twenty-nine disadvantages of using the e-learning technology that were identified and reported by the interviewed academics. They are listed in order of the frequency by which they were mentioned by academics. The first five listed advantages and disadvantages were mentioned three or more times by different academics and all the rest were mentioned at least once.

List 4.1 Showing advantages of e-learning suggested by interviewed academics

Advantage
1. Flexibility for academics.
2. Ease of uploading/downloading materials.
3. Technology helps and enables them to reach people/students all over the world.
4. Easier to search for information.
5. Email communication.
6. Easy to prepare notes.
7. It serves as storage space.
8. Sharing - transmission of video tutorials.
9. Sharing - Interesting materials can be passed around rapidly and with ease.
10. Reduction of printing lecture notes.
11. Increase and being able to support large student numbers.

List 4.2 Showing disadvantages of e-learning suggested by interviewed academics

Disadvantage	
1.	Time spent learning the e-learning System.
2.	Loss of face to face contact with students.
3.	Copying and memorising materials by students.
4.	The downtime technical problems in IT/Network.
5.	Increased work hours. For example the materials have to be crystal clear, and even a single line takes time and thought to write upload and communicate.
6.	Increased work hours due to online assessment.
7.	Lack of uniformity, academics screens are different having different links.
8.	Complexity - some academics find use of e-learning systems difficult, especially mature lecturers.
9.	E-learning software does not identify the individual needs of the student.
10.	The technical support is not always good or timely.
11.	Some functions require third party support that wastes time.
12.	Software crashes, freezing and slowing down.
13.	There are frequent software updates necessary to add a new function or to fix bugs.
14.	Training - Stress and frustration of using and learning the technology.
15.	Compelling, pressurising and forcing teachers to use the system.
16.	Lot of red tape, i.e. every text that is uploaded has to be verified and checked by senior management.
17.	Increase in copying and repetition of the same materials and tasks every term.
18.	It does not reduce repetition, i.e. you instruct the e-learning system then this has to

	be repeated/ announced to students.
19.	Some students do not use the system causing replications of tasks.
20.	Copyright problems for published and unpublished work.
21.	The routine tasks the e-learning system is used for can be done by other means such as creating academic's own websites to upload / download information and using alternative emails to communicate.
22.	Creates a digital divide between mature academics and younger technologically competent academics.
23.	Some academics are 'technophobic' or against technology as a whole.
24.	Academics becoming facilitators rather than good teachers.
25.	Students and academics become less creative.
26.	Institution treating academics as a commodity/product; academics feeling of irrelevance.
27.	It's more suitable to undergraduate teachers than for research supervisors.
28.	Moral objection: an e-learning system can be used to discriminate against poor students who are unable to pay their fees (students get locked out of the system for non-payment of fees).
29.	Psychologically limits the students academically making them believe no further reading is required as they believe the notes provided are sufficient.

4.2.3 Advantages

The number of drawbacks of e-learning technology vastly outweighs the number of perceived benefits; however, it appears that the advantages are so great that the use of e-learning technology is irresistible to higher education institutions (see list 4.1 and list 4.2). All academic staff interviewed pointed out both benefits and drawbacks of the technology, and surprisingly even those academics who do not often use technology or are in opposition to the e-learning system suggested some of the benefits. The numbers of benefits appears to be heavier in scale than the numerous disadvantages mentioned by academics; hence institutions are demanding their academic staff use e-learning technology.

The disadvantage list comprises the opinions of academics; for example disadvantage number 28 states academics have a moral objection to their e-learning system because it is used to discriminate against poor students who are unable to pay. When students do not pay they are locked out of the system and unable to complete their study. This disadvantage could be avoided if institutions were to support and maintain the teaching facility, staff and resources of students who are struggling to pay their fees. However this research concentrates on what academics think, not what the researcher believes it is right.

Item 29 in list 4.2 states that e-learning psychologically limits the students academically, making students believe no further reading is required, and the notes provided are sufficient which in turn makes students lazy. It can be argued that the same affect can occur through the use of printed out lecture notes distributed by academics in class. This shows some of the disadvantages could be challenged; however that is not the aim of this project. Advantages and disadvantages which are gathered in this project through the interviews are assumed to be true, and will be treated as so.

It has to be noted that the needs of academics and the specific needs of the institution may differ. The needs of institution may not benefit all academics individually, but may

instead benefit the entire workforce of the institution as a whole. Institutions need to attain income to support their activities such as building research credibility, investment and recruitment of the best talents and marketing. Therefore institutions will invest in technology such as e-learning systems taking a broader view which are possibly not always best for individual academics.

A lot of advantages mentioned in list 4.1 can be seen to benefit an institution as a whole. For example, e-learning platform provided an online centralised storage space and communication facility for the benefit of all, staff and students. Also, the e-learning system enables the breakdown of geographical boundaries to gain larger cohorts of students which is beneficial for institutions financially. The benefits of recorded audio and video presentation, transmission and sharing do not benefit all academics individually but does benefit the institution as a whole. The benefit of printing less saves money, the benefits of making notes or content more easily available benefits the whole institution and it appears they are the key drivers for institution management to compel academics to use the system. This is supported by literature which argues that e-learning systems are widespread due to the potential recruitment of a greater number of students and ultimately a financial incentive (Chen, 2011; Chapman, 2012).

4.2.4 Disadvantages

The majority of the academics who were interviewed held the view that they were being compelled to use the e-learning system provided by their institution. Two academics stated that they were being pressured into using e-learning technology against their will. All other academics were sympathetic to the institutions wishes because they said the time and environment demands the use of e-learning systems. The time and environment refers to the current time we are living in, where institutions aim to maximise use of technology to reduce cost, to gain the benefits the technology provides, see list 4.1 and this is occurring throughout the higher education industry.

These academics believe the institution does not have a choice, and they use e-learning system because e-learning systems cannot be avoided, all course notes, student registration, course management resources are all uploaded to the e-learning system. The academics who stated they have been pressured into using it did state that if information and benefits were explained appropriately to them then they might not fight so hard to resist it.

In a way, the academics pointed out that their role had changed in a negative sense as a result of the implementation of e-learning technology. There are a lot of repetitive tasks required of academics with the same material copied and duplicated every teaching term. The same materials are also getting passed between academics and institutions making academics less creative. According to one academic, those trained in the 1950s or 1960s were taught in a very "boring fashion" (Dr K, Interview, appendix 4), and did not have the luxury of the modern tools and support to help them, but are thought to be more creative as teachers.

The negative effects of e-technology can also be seen on students. Academics reported that students tend to merely memorise teaching materials, sometimes word-for-word. They also reported that Blackboard has not helped academics in their communication with students as often students do not check the e-learning system or their emails for instructions and clarifications, meaning that academics must answer the same questions time and time again. This has led to increased effort and annoyance for academics.

One academic who teaches postgraduate Law stated he did not use the e-technology because it was more suitable for undergraduate and taught courses and not suitable for postgraduate courses. In courses where emphasis is put on the requirement for the latest research or access to new legislation passed by parliament, the online learning system is not able to cope with constant updates, and hence is not highly regarded in these circumstances.

A few academics suggested there was a divide between the older or senior academics, who may not like using technology, and the younger or more recently trained academics, who may be more content with it. They stated that regardless of academic's preferences for the use of technology, everyone has to adapt to the change as it has become a corporate strategy. However, they recommended that institutions should do more to encourage mature academics to adapt to this change. Mature academics will have different issues with technology. Where mature academics are sometimes nervous and technophobic they require encouragement, where they have developed a habit of not using technology the solution would be for increased understanding, facilitation and training. Where mature academics do not like e-learning technology due to poor user interface or complexity, then their encouragement required would be to access better support, facilitation and improved interface to help them.

It can be stated that the majority of disadvantages in list 4.2 effect individual academics, rather than the institution as a whole. For instance loss of face to face communication with students, increased work hours due to online learning such as developing materials, increased work hours due to online assessment, increased repetition such as announcements, emails and verbal notifications are all ways that e-learning can be seen as effecting academics personally.

The data shows that some of the disadvantages of e-learning noted by academics in the interviews are a benefit to institutions by saving labour costs. For example, academics complained that they have longer working hours by supporting students with technical support queries, increase in online assessment, dealing with email, forum, blogs and chats with students. In all of these tasks, time and labour is being benefitted by institutions to support their larger intake of students from different locations throughout the world as universities in the UK are trying their utmost to recruit students from abroad. The e-learning system allows the central control and ownership of the content whilst as before academics controlled and owned content. The online learning system builds up institutional control over academics and their content.

4.2.5 Categorising the disadvantages: effects on institution, academics and students

The data displayed in lists 4.1 and 4.2 is further analysed in this section. The disadvantages have been grouped into 14 categories based on their similarities. Not all the disadvantages of the e-learning system have a direct effect on academics, and in fact, some of them primarily affect students. Although the disadvantages for students were identified as major issues by interviewees, this research is focused only on the effects upon academics.

The various disadvantage categories listed below, further analysis was conducted on the issues that had a direct negative impact on academics which are colour coded in yellow within Table 4.3.

Table 4.3 Showing the breakdown of twenty-nine disadvantages to fourteen broader categories. Colour code: Green- primarily affects students, Yellow- primarily affects academics.

Category Number	Category	Disadvantages
1	Quality lost	Loss of creativity/ quality
		Copying and memorising materials by students
		Students become less creative
		Psychologically limits the students academically as they believe that no further reading is required; the notes provided are sufficient
2	Plagiarism	Copying materials, Copyright problems.

3	Moral objection	e-learning systems can be used to discriminate against poor students who are unable to pay their fees (students get locked out of the system for non-payment of fees)
4	Not Suitable for all	E-learning software does not identify the individual needs of the student
		It is more suitable to undergraduate students than for research students
5	Alternatives are available	The routine tasks the e-learning system is used for can be done by other means such as creating academics own websites to upload/ download information and using alternative emails to communicate
6	Technical problems	The downtime technical problems in IT/Network
		Software crashes, freezing and slowing down
		Software updates are often required; patches to add a new function or to fix bugs
		Lack of uniformity

		Some functions require third party support, which wastes time
		The technical support is not always good or timely
7	Time	Increased work hours due to online assessment
		Increased work hours due to creation of crystal clear materials
		Time spent learning the technology
		Some students do not use the system; therefore academics are forced to double their effort to teach.
8	Red tape	Every text that is uploaded has to be verified by senior management
9	Training	Difficult and complex, especially for those who are less technology friendly
10	Pressure on staff	Compelling, pressuring and forcing teachers to use the system
		Some academics are 'technophobic' or against technology as a whole

11	Health Hazard	Stress and frustration of using and learning the technology
		Technology can be a health hazard, i.e. not sitting appropriately
12	Digital Divide	Creates a digital divide between mature academics and younger more technology-competent academics
13	Faceless teacher	Loss of face-to-face contact with students
		Academics becoming facilitators rather than good teachers
		Teachers becoming less creative
14	Devalues lecturers	Institution treating academics as a commodity

Colour Code:

Effecting students primarily

Effecting academics primarily

Any of the disadvantages listed in 4.2 have an effect on an institution. However some disadvantages are more acute and flagged instantly when they are spotted and instant actions can be taken to resolve the matter because they may have an obvious cost to the institution. Below are some of the main disadvantages that effect the institution, and have immediate financial implications:

Table 4.4 Showing the main disadvantages of e-learning which effect the institution.

Category	Disadvantages
Plagiarism	Copyright problems for published and unpublished work.
Technical Problems	The downtime, technical problems in IT/Network. Software crashes, freezing and slowing down. Software updates are required to add a new function or to fix bugs.
	Lack of uniformity.
Other technologies	Some students do not use the system causing replications of tasks. The routine tasks the e-learning system is used for can be done by other means such as creating academics' own websites.
Support	Some functions require third party support that wastes time and costs institution.
Training	Difficult and complex to use.

A question can be posed as to why academics' increase in time and labour is not added to institutional disadvantages. Institutions can be seen as benefiting from larger cohorts of students; however the salary remains the same for academics. Academics are spending more hours on the e-learning system for teaching and learning and it is not in the interest of institutions to pay extra. It may be seen by institutions that academics have a duty of care to provide few extra hours towards students performance. This has a negative effect on academics which can lead to stress and frustration and lead to days off sick. This in turn effects the institution of lost labour, increase in cost by paying

for cover and loss in student learning. However if academics demanded reimbursement then institutions would step in to resolve problems as they would not want to pay anything extra in regards to disputes, dealing with trade unions and staff labour costs

For the categories of technical problem, other technologies and plagiarism, all these can instantly effect institutions severely. Technical problems can amount to severe costs as institutions invest in academics and administrative staff to work and if technical problems exist then staff will not able to work which will disrupt the service they are supposed to provide.

Training and support also has a financial implication as if staff are not trained then they are not utilised well therefore the institution is not getting the best value. If staff members are not supported technically then their work is not completed according to policies. Plagiarism and copyright problems affect institutions' credibility and publicity. They lead to lost work, other people taking undue rights, credits and therefore is costing and damaging institutions assets.

4.2.6 E-learning technology changing academics role

All academics agreed that the role of a teacher has not changed fundamentally, but e-learning technology has affected and changed it in minor ways and it will continue changing depending on the speed of innovations. All academics reported that these changes were related to increased hours of online activity, communication/interaction between academics and their students, flexibility, and an increase in distance learning students.

"I think that we are made to do more for ourselves now" Dr F Interview, see Appendix 4.
"No, not really because the traditional delivery of lecture is there" Dr B, Interview, see Appendix 4.

Since the technology is changing academics' roles as they are doing more themselves, some senior lecturers expressed concern that:

"Teachers should not lose awareness of why they are there: to give quality education, to prepare materials for the students need, to teach and not just become a facilitator, use the correct vocabulary and specific needs of the individual as a responsible human being not just copy paste or download general materials" Dr. K Interview, Appendix 4.

The technology overlooks the needs of the individual and generalises the student population. Academics were concerned that institutions are rushing ahead and moving too fast. Institutions are spending huge amounts of money procuring new hardware and software so academics use technology. Sometimes these decisions concerning huge procurement are costly and are made in haste. They do not always bring about the benefit they hoped (Dr K , interview, Appendix 4). Institutions should be steady, and assess and evaluate the situation before make big decisions.

4.2.7 Training required for academics

"For someone who finds Word difficult, Blackboard can be intimidating." Dr G Interview, Appendix 4.

Nearly all of the academics interviewed said they attended training when they joined their respective institution or when e-learning was initially installed.

Three academics who taught non-technical subjects attended training sessions, but were dissatisfied with them. They reported that the training was very theoretical and they did not get the chance to experiment or receive sufficient hands-on training. They recommended that the training should be completely changed. Rather than attending a theoretical lecture on how to use the technology, they would have preferred to have an instructor next to them while they were experimenting with the system so that they could receive guidance. Two academics said they had attended one training session since they started teaching, which was not sufficient. They reported needing more training, yet the institution management has not invited them for further training.

Eight academics felt the training was adequate and they probably would not attend any future training. They felt that they had sufficient knowledge and the basic technology competency to use the system. These academics felt they had the competency to use the e-learning system, regardless of whether they were teaching technical or non-technical subjects.

One academic did not attend any form of e-learning training although the institution did invite him to attend. He suggested several reasons why he did not attend which included: a dislike of technology as he perceives it as too complex, wanting nothing to do with e-learning, believing it will not benefit him in any way, and thinking that it would be a waste of time. However, he reported that he could be persuaded to attend in the future if the training was less technical, and was short and sharp to the point.

Those who reported that the training they received was inadequate tended to be mature lecturers, who were more experienced and specialised in non-technical subjects such as Business, Law, Languages and Health Sciences. Those who stated that training was adequate tended to be junior staff and to come from Science, IT technology and Engineering subjects.

Since e-learning systems are changing, retraining is always required. Regardless of the amount of training already received, the majority of the academics interviewed felt retraining was always required if major technological changes were to occur.

Section 4.2.9 highlights the complexity of the Blackboard assessment module as a reason for extra labour and time consumption during the assessment period. This leads to the training requirement, not only should training be conducted appropriately but the type of training required is important. Academics who are familiar with navigating the Blackboard system, uploading and downloading tutorial notes should be given training in what they need, i.e. tailor made training and support. For other academics who find the technology complex, a basic form of training needs to be arranged.

Academics should be trained before the assessment period, and during assessment period the e-learning support team should be prepared for queries related to the assessment module so that instant support is provided. Therefore appropriate timing of support is important and tailor made training is required. Having academics that are well trained will lead to the saving of time and labour in the assessment period and in general academics would find the e-learning technology easier to use through successful training.

Academic training, re-training, gaining support and using variety of functionality has an effect on academic workload. Institutions have implemented systems that ensure training is always required. Frequent training is a source of workload increase.

Institutions not only should think about reimbursement to academics for extra time and effort spent on the e-learning platform but institution management should allocate time for retraining so that this does not have a wider impact on their other duties. It is important that institutions do this; if academics do not re-train then it is a step back in their productivity.

The effectiveness of the e-learning training is a primary concern. According to four academics, the training is not effective because it is either too theoretical or too complex. This is leading academics to avoid the necessary training required to be an effective teacher. This also gives ammunition and opportunity to those who are technophobic to validate their claim of technology being useless and not suitable.

Several of the academics pointed out the uniformity issues with the Blackboard system. They explained that every teacher has his/her own way of doing things and everyone organises materials and content differently. This causes problems with students and staff as they are not familiar with the layout, especially if their technical competency is basic or the technology is too complex. The solution would be to standardise a uniform framework that all academics must follow.

As for the scheduling of the training, one lecturer pointed out that the majority of the training takes place during holiday periods. He would prefer the training moved to a working period, such as term-times, so he does not have to use his holiday period to learn new technology.

4.2.8 Frustrated and annoyed academics

Seven academics who were interviewed said using technology often caused them to become frustrated, while two academics said it caused them annoyance rather than frustration. Three academics said they support the use of e-learning technology, the more it is used, the better it is. There are no patterns in subjects, age, or experience between those academics who reported feeling frustrated with using technology and those who did not.

Knowledge-Base Forum should help to remove some of the frustration of e-learning technology. By reducing academics time in researching and writing content, they will have more time to undertake training, and be able spend more time interacting with students via the e-learning technology, therefore Knowledge-Base Forum will reduce a level of academic frustration.

4.2.9 Longer working hours

Analysis of data shows that academics were spending an increased amount of time using the e-learning system. The data shows one academic's use of e-learning system was like a full time occupation on top of teaching; he used up to 40 hours a week. Five academics said they spent between 12- 20 hours a week and the other six academics used it between 2 to 10 hours a week. When asked if they felt they spent too much time with e-learning technology: Eight academics said 'no' they felt it was normal; only four academics felt they spent too much time with e-learning technology.

"It's a full time job in addition to teaching". Dr D Interview.

"It's about 50%" of time spent with e-learning a week. Dr I Interview.

"I would say about 12 or 13 hours per week preparation, and the presentation about 13 to 15 hours per week". Dr A Interview.

"Eight hours a week in total" Dr. K Interview.

"Three hours a day" Dr H Interview.

However, little of that time was spent on specific e-learning platforms such as Blackboard or Moodle. Most of time was spent on research, email communication and preparing the materials for the e-learning platform. The Blackboard or Moodle platform is an access point to get to other applications.

"I would probably use the computer for maybe six of those eight hours in preparation and that would mean looking at old lessons and creating worksheets for the students on the computer. " Dr. K Interview.

"internet and email and everything maybe two to three hours a day" Dr H Interview.

This indicates that the e-learning platform on its own, such as Blackboard or Moodle, has minimal effects on academics increased working hours on day to day routines and workload. It shows that if Blackboard was not available, academics would use other applications such as emails, various research databases and student systems to do their work which would of taken a similar amount of time and labour, with the exception to Blackboard assessment as academics have said that it takes time to learn and is complex to understand and operate.

The data shows the busiest time using e-learning technology is in the beginning of terms and during the assessment periods. At the beginning of term the application is mostly used for preparation of course materials and other organisational tasks, and

again it is used frequently at the end of term because this is when online assessment occurs.

Academics also commented on the complexity of Blackboard assessment, this correlates with busy assessment periods, as during the assessment periods the e-technology use rises. Therefore it can be said that Blackboard assessment module takes up academics' time and is labour intensive. A solution to this problem has to be that attention is needed from the e-learning support team, to arrange additional training for this specific module or replace it with alternative assessment tools that have a reputation for being user friendly and easy to use.

There is no pattern as to the amount of time any one sub-group (when categorised by age, gender, experience and subject speciality) reported spending on e-learning tasks. These variations are most likely due to individual preferences, different ways of working and how individuals organise themselves. The only clear pattern is an increase in the number of hours spent on the job, to an extent that an academic spending up to 20 hours a week felt they are not spending much time using e-learning technology or that they have no choice but to use it as a teaching aid.

One academic estimated that in his institution, 50% of students do not use the e-learning platform provided by the institution. As a result he spends time updating the e-learning platform whilst at the same time making in-class announcements, handing out materials and sometimes sending emails to students' personal email accounts to make sure that students are engaged with the course content. Generally students do not take proactive measures of preparation and learning (Dr J Interview, Appendix 4); majority of time students turn up to class with a pen and paper expecting to be spoon-fed. If all students were required to use the e-learning system then it would save lot of time and effort for academics.

"You are compelled to use the technology, sometimes to send your stuff through online and most of the time students are waiting for you, as well, to use that software or that

system to get access of what you have uploaded. Even though if I can see them, they would still ask me 'have you done this, have you done this' and I would say that I would do this tomorrow next time, the day before…" Dr J Interview, see Appendix 4.

Another reason for the increase in online activity for academics is the need to make teaching materials easy to use and understand. Academics reported that to write a single line can take lot of time and thought, particularly as writing must be error-free and free from confusion, misunderstanding and misrepresentation.
"When you are teaching in a trusted environment, you don't have to write every word down, you might talk around a subject, but in a virtual learning environment everything has to be crystal clear even the simple thing, even a simple online article, make sure that it's not misunderstood because in the classroom some people will say, can you explain that a bit more" Dr E Interview, see Appendix 4.

The online learning technology has given students the chance to ask questions or seek clarification of academics anytime day or night. While the questions may not be answered immediately, the expectations on academics have risen, i.e. as soon as the questions are asked, the answer is expected promptly. Further, in the past academics were not expected to give out notes and materials (Dr K interview, see Appendix 4); rather the emphasis was on the delivery of quality lectures and the goal was to make sure students understood the content by giving verbal explanations and theories. This was much easier as academics could talk around the subject and were not expected to write every word and present it to students in the form of notes or other materials.

The qualitative interview data shows substantial ill effects to academics utilising e-learning such as increase workload. This is due to students having the ability to contact academics 24 hours a day by email, chat, forums, and mobile devices. E-learning technology has raised student expectations of getting a quicker feedback. Also academics reported that to create materials takes time and labour intensive, to write a single line can takes time and has to be error-free, clear and presentable. This suggests a need for a system to reduce hours spent on writing material to save

academic time so they can concentrate on their teaching role. This is precisely what Knowledge-Base Forum prototype in chapter 5 will address.

The next section 4.2.10 will review specific literature relating to academic workload and then section 4.2.11 will analyse transaction logs. Both sections to show other sources that support the first phase interview analyses.

4.2.10 Literature supports longer working hours

The literature broadly supports the fact there is a time increase when e-learning is used, this was discussed in literature review section 2.4, supported by: Reeder (2004); Conrad, (2004), and Mihhailova (2006); Vonderwall et al (2007); Mayes et al (2011); Nandi et al (2012); and Tomei (2006).

The first round of interviews highlighted many issues for academics; these issues were supported by another study carried out by USA based Educase (Arabasz et al., 2003). The Centre for Applied Research who manage the .edu Internet domain. Educase has a membership of thousands of institutions of higher education and corporations serving the higher education. The Educase study was participated in by about 300 colleges and universities in the USA. Some of the findings from this study include:

1. Institutions are unable to cope with the support required for academics:

"70 percent of survey respondents indicated that growth in instructors' support demands will outpace their institution's ability to provide the needed support" (p.9).

2. The report explicitly stated that the single most challenging factor of e-learning was the amount of time required to develop and maintain e-learning materials.

The participants from various institutions who took part in the study used the following terms to describe the increase in time required when e-learning was introduced: *"shock," "surprise," and "drastically underestimated"*

Academics spend lot of time and effort on *"Reengineering the course to adapt it for online delivery" (p.40).*

The study also supports findings from this research that the technical and pedagogical training required also adds time, effort and workload to academics:

"By and large, instructors tend not to initially comprehend that e-learning instruction differs fundamentally from traditional approaches and requires a major commitment of time and training" (p.40).

Another reason time and effort has increased regarding academics use of technology is that *"additional time is needed to communicate with students such as emails" (p.40).* The report highlights this fact clearly:

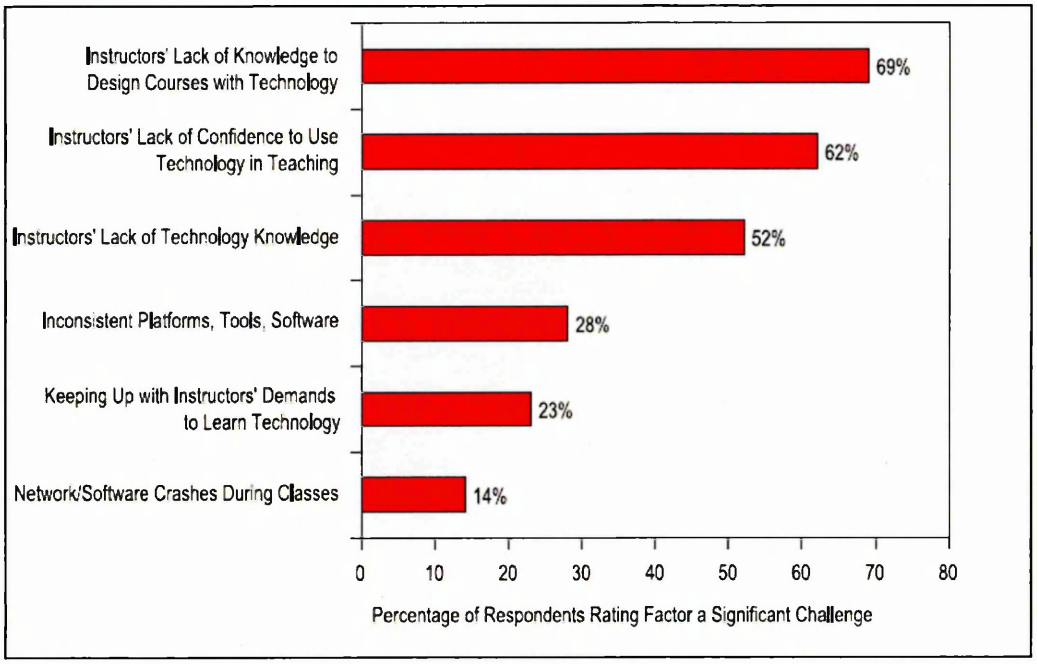
"The biggest issue we've seen is the enormous volume of correspondence with students, and the time that it requires" (p.41).

3. The Educase report also supports the training requirement found during the first round of interviews:

The report identified academics' *"lack of knowledge to design courses with technology" and "lack of confidence to use technology in teaching" (p.46)*. This clearly highlights the need for better training for academics.

The study found that technology support challenges are a fact and that more support is required by academics. Figure 4.1 shows the issues highlighted by the 260 respondents:

Figure 4.1 Academics difficulty with e-learning technology (Arabasz et al., 2003: p.46).

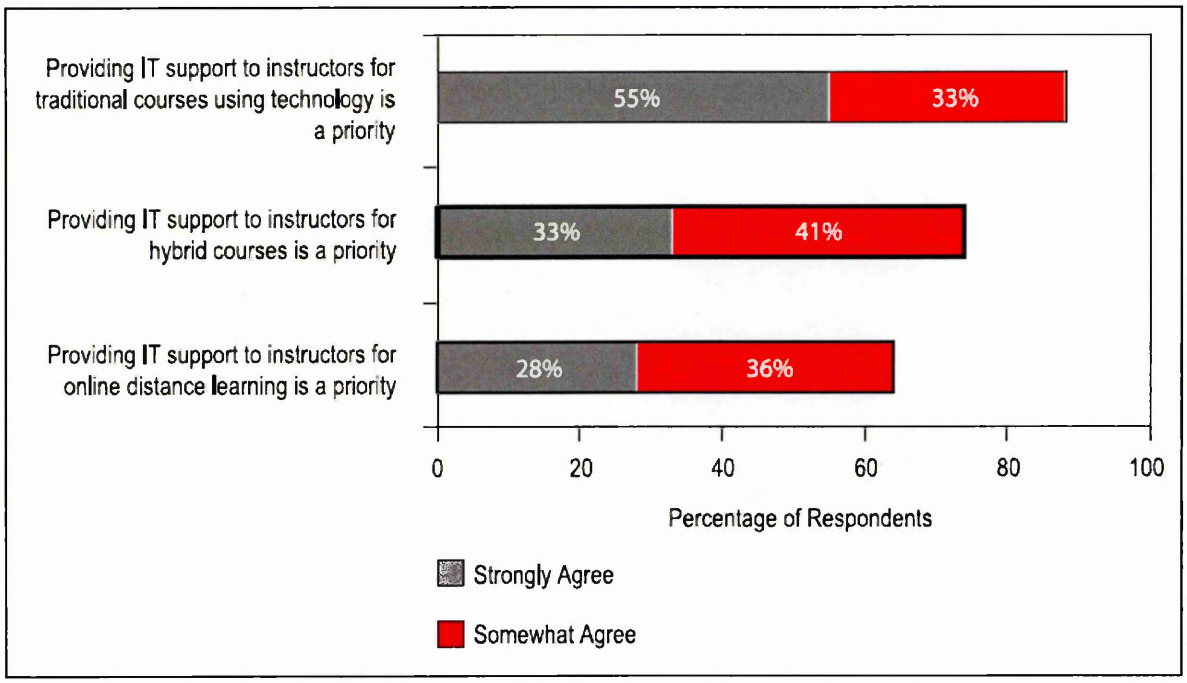


The below figure 4.2 shows the perspectives of 260 respondents on how strongly they view that academic support is required and shows a greater support required for traditional methods of teaching.

4. Greater support is required from institution regarding e-learning technology.

Academics have stated their greater requirement of support on the use of e-learning technology. Figure 4.2 shows that out of 260 respondents all agree that academics require support strongly or somewhat strongly.

Figure 4.2 shows academics require support strongly (Arabasz et al., 2003: p.47).



Creating e-learning course elements and help with online material are required, as shown in Figure 4.2. This indicates some support for the Knowledge-Base Forum.

5. Educase study supports Knowledge-Base Forum bases. As figure 4.3 from Educase study below shows that academics would like their institutions to support them on the following issues:

Figure 4.3 shows that academics would like support and highlighted they require content creation support

Technology Issue	Share of Effort (Percentage)
Assist with Hardware, Network, Technology	25
Technology Training for Instructors	20
Assisting with Pedagogy Issues; Adapting Courses	12
Assisting in Tech Tools and Resource Selection	11
Managing Network Availability and Capacity	10
Creating E-Learning Course Elements	8
Troubleshooting Network Outages	7
Online Material or Copyright Research	3
Intellectual Property Management	2
Other	3

Creating e-learning course elements would also mean supporting academics with content creation. Support for online materials was also highlighted, along with support for resource selection. The highlighted points support the concept of Knowledge-Base Forum, as a way to manage academic-student interactions effectively.

4.2.11 Blackboard transaction logs support interview findings

Data was collected from Blackboard system, transaction logs containing records of 24 academics from six different schools at Middlesex University. The data was collected for the purpose of understanding time spent on the e-learning system by academics and to verify the findings from the first set of interviews.

Table 4.5 summarises the details of the transaction logs, it divides the data by departments and shows the average logged in hours per week for individuals in Blackboard system. Table 4.6 divides the transaction data into four groups by number of hours academics used Blackboard system.

Table 4.5 Blackboards logs of usage by academics from Middlesex University.

School	Academic	Time spent per week on Blackboard
Art & Design	Lecturer 1	1h : 36 mins
Art & Design	Lecturer 2	5h : 58 mins
Art & Design	Lecturer 3	20h : 45 mins
Art & Design	Lecturer 4	50 mins
Average time for Art & Design		7.3 hours
Business	Lecturer 5	3h : 12 mins
Business	Lecturer 6	5 mins
Business	Lecturer 7	4h : 53 mins
Business	Lecturer 8	2h : 27 mins
Average time for Business		2.7 hours
Media & Performing Arts	Lecturer 9	4h : 34mins
Media & Performing Arts	Lecturer 10	28 mins
Media & Performing Arts	Lecturer 11	11 mins
Media & Performing Arts	Lecturer 12	9h : 34 mins
Average time for Media & Performing Arts		3.7 hours
Health & Education	Lecturer 13	3h : 48 mins
Health & Education	Lecturer 14	1min
Health & Education	Lecturer 15	4h : 20 mins
Health & Education	Lecturer 16	36 mins
Average time for Health & Education		2.5 hours
Law	Lecturer 17	9h : 23 mins
Law	Lecturer 18	2 mins
Law	Lecturer 19	2 mins
Law	Lecturer 20	4h : 34 mins
Average time for Law		3:5 hours
Science &Technology	Lecturer 21	3h : 10 mins
Science &Technology	Lecturer 22	10 mins
Science &Technology	Lecturer 23	1min
Science &Technology	Lecturer 24	4h : 56 mins
Average time for Science & Technology		2.08 hours

Table 4.6 Breakdown of usage into four groups by academics from Middlesex University

Time, hours – usage in a week	Number of academics
0 – 5 hours	18
5:01 hours – 10 hours	5
10:01 hours – 20 hours	0
20.01+ hours	1

The data collected from Blackboard computer logs shows academic log-on time and continued activity but does not show passive time where an academic may be reading an article, writing content or answering student queries; since no action button is clicked it is recorded as un-active. An example is that academic is shown logged in for 1 minute and there is no activity, this is recorded as the academic logged off. However this may not reflect a true picture of academic online working hours as an academic may be reading an article, preparing materials using other applications, corresponding with students using Gmail, Hotmail, Yahoo or using video conferencing tools such as SKYPE and thus they will not be shown in the computer log. This has been confirmed from the first phase of interviews in section 4.2.1 with academics that they use other application and e-learning tools to support learning.

Referring to just the time spent on the Blackboard system, the log data shows one academic using the e-learning system for over 21 hours in a week. Five academics spent between 6- 10 hours a week, which is up to a quarter of their full-time working hours. The one academic working 21 hours a week on the e-learning system is substantial and similar to the one interviewee in the first round of interviews. The interviewees' use of e-learning was like a full time occupation on top of teaching, as he spent up to 40 hours a week on Blackboard. In the first round of data collection through interviews with academics, five academics said they spent between 12- 20 hours a week using e-learning software, and the other six academics used it between 2 to 10 hours a week.

The interviews from academics recorded greater working hours on e-learning software than from the Blackboard logs as academics use other forms of e-technology to support their academic duties.

Due to the fact that not all e-learning activity is recorded through the Blackboard logs, they are not able to act as a benchmark for the success of the Knowledge-Base Forum prototype which was developed as a result of this research. However combining the first phase interview data with literature in section 4.2.10 and the transaction logs gives a picture that some academic are spending long hours using e-learning technology.

From the first round of interviews (see section 4.1) we learnt that little of academics time was spent on a specific e-learning system such as Blackboard or Moodle. Most of their online time was spent on researching on the internet, email communication and preparing the materials for the e-learning systems. Blackboard or Moodle most of the time acts as an access point to get to other applications. This is supported by the fact that an academic has been shown to use the e-learning system for only 1 minute; because they were busy using other applications, and logged into Blackboard to access these.

From the interviews it was highlighted that another reason for the increase in online activity is the need to make teaching materials easy to use and understandable. Academics reported that to write a single line of text could take a lot of time and thought, particularly as writing must be error-free and free from confusion, misunderstanding and misrepresentation. The data from Blackboard log would not show this time spent writing as it only recorded log-in times and the actual click of buttons within blackboard.

As stated in the first set of interviews, the Blackboard system is mostly used to access other applications, communicate with students, and to upload and store content. Therefore the log shows that a fair amount of time each week is spent on these activities. This adds to academics' workload and increases the time spent on e-

technology. This supports the idea of a Knowledge-Base Forum, with the aim to manage academics interactions effectively without increasing the academic workload.

4.2.12 Increase workload for academics

The interview results showed academics were spending many more hours using technology than in previous years before e-learning technology became popular; this increase in hours is due to the time required for the production of quality materials, time spent learning technology, and utilising online assessment which is a complex task. There has been an increase in time and effort related to dealing with technical problems and technology downtime. Additionally, the increase in red tape, checks and balances put in place to verify content accuracy and presentation by institutions, time spent on repetition for announcements, writing emails and using web portals to put out the same message has created an increase on academics use of technology. Overall the complexity of these problems can lead to cognitive overload.

The interviews highlighted other factors which could affect cognitive load, such as training complexity and academic roles changing where academics are doing more administrative work than before, this was also supported by literature in section 2.5. Learning the administration functionally of the technology is adding more work load to academics.

In their wish list (see section 4.3) academics suggested that the use of multiple applications to fulfil their role is creating extra work and cognitive load. These include the complexity of online assessment, adding video tutorials with lectures and designing quizzes and other multimedia presentations to help students. It is realistic to say that the six challenges facing academics lead to academics overloaded with work and cognitive processing. Academics have stated that if a production of material facility was available this would save time and effort, which would no doubt help with their cognitive load. This supports the concept of a Knowledge-Base Forum, which would effectively

manage interactions, without increasing academic workload. In fact, the concept of Knowledge-Base Forum should free up some of the academics time in researching and writing content, allowing them to spend their time more effectively on other areas of e-technology.

4.2.13 Academic work contract

Utilising Knowledge-Base Forum is a tool that can help the academic role. From the first phase interview analysis the following disadvantages were found to have added workload to the academic role since e-learning was introduced:

1. Time spent learning
2. IT downtime / Technical problems
3. Online assessment
4. Increase in red tape
5. Complexity of e-learning technology
6. Increase in repetition, announcements and emails
7. Students not using the system
8. Pressurising staff to use e-learning technology
9. Lack of uniformity
10. Systems that do not identify individual needs
11. Third party support required which takes up academics' time

Academics mentioned that institutions were encouraging e-learning to reduce costs by streamlining processes and reducing the need for administrators. As a consequence of reducing administrators, the workload has been transferred to academics. An academic during the first phase interview discussed this problem and stated that academics should not entertain certain administrative duties such as creating and uploading material to e-learning system, rather a specialist administrator should take on this responsibility to free academics to teach (Dr G, interview, appendix 4). In academics' job contracts it is stated that the role will encompass teaching and also administration

but they do not specify the number of hours required for each of these tasks, and specific guidance is not given on e-learning. Three job contracts of Middlesex University were reviewed: one contract from the English department, another from Psychology and one from Computing. None of the contracts specified the number of hours expected for the use of e-learning technology or compensation details for extra workload, but instead they contained a general description stating that it is up to the department and agreement with line managers to settle the hours spent in administration and the requirement for compensation.

The academics' wish list created (section 4.3) from the first set of interviews put emphasis on management support and supplementing administrative support to ease academic workload, which the literature supports. This supports the view that insufficient compensation is awarded to academics.

4.3 Academics' wish list

During the first round of interviews academics suggested many ideas on how to improve the technology to support their roles as teachers/facilitators and to better manage the drawbacks in the current e-learning platforms. Within the semi-structured interviews, questions were asked of academics of the benefits and drawbacks of e-learning technology, which allowed for a discussion to take place where academics made suggestions for how things could be improved. A question was also asked about whether there had been a change in their job roles, which also enabled them to state a solution that may help to resolve their problems in regards to increase frustration/ stress/ workload. This data was categorised as a wish list during the analysis phase of the interview data.

The wish list consists of thirty suggestions grouped under various categories according to similar themes. The sections below, labelled 4.3.1 to 4.3.20 list the 20 categories, with the numbering within the sections (1-30) representing each suggestion that the

academics made. These next sections identify where the suggestions are applicable to the creation of a prototype technical solution, which would meet objectives three and four of this research. For a summary of the wish list, see Appendix 7.

4.3.1 Human Support

1. The first suggestion is to make sure the right kind of reliable person-to-person support is available to academics. Institutions should create awareness and guidance on the benefits of the technology. The use of pressure will not work and can lead to an undesirable atmosphere in higher education institutions.

"I think there should be a lot of support to help teachers with difficulty. A lot of support from within the department and for the people to understand that there are people like myself who really need back up support from the directors – so phone somebody and ask if he can come and help you and actually support you in class. So definite support and reliable human being support." Dr K Interview, Appendix4.

4.3.2 Student expectation

2. This involves managing expectations of students and academics. If student expectations are not met then student learning satisfaction is reduced. This creates frustration and sometimes student disengagement, not necessarily because academics were inadequate but because the expectation was unrealistically high or different to what was expected. Institutions need to make sure academics and students know what to expect from the technology. For students, e-learning supports their learning experience, and their learning is not for the purpose of learning the e-learning technology. This means the students will not be graded because they learn the e-learning technology but it is there as a tool to be utilised for their research and learning activities.

"Key to all this is to manage expectations". "And we need to make sure that the students know what to expect from this technology and it is technology that supports their learning and that (e-learning) technology is not for their learning." Dr G Interview, see Appendix 4.

When expectations are not managed, academics will feel the tasks they are assigned are out of control:

"I find that frustrating where you feel everything is getting out of our control in sense, we are getting dictated to by machines." Dr K Interview, see Appendix 4.

3. Students should be informed of the support that is available to them and where to go, besides their tutors, when they face technical difficulties.

"Always the same kinds of questions come up from students." Dr K Interview, see Appendix 4.

4.3.3 Managing organisational variations

4. It was found that administrative, organisational, staffing and behavioural changes effect e-learning. A frequent change in staff and their level of expertise effects online content and the effectiveness of the e-learning tool. Changes by school administrators managing course content or the organising or transmission of learning materials may also have an effect on distance learning. Also variation across an organisation, from one department to another or from one academic to another, can lead to student frustration and unsuccessful learning.

"I'm thinking again just making sure that the right kind of support is there, that's what I really think understanding that some of us will withdraw even more if we feel there is pressure, pressure, pressure." Dr. K Interview, see Appendix 4.

"Some of our colleagues are doing things in a particular way and we are doing things differently." "If you want to put a video in, it's really complicated and we got to get a third party to do that" Dr. E Interview, see Appendix 4.

"I think there are still some people lagging behind because they're so busy with other stuff all the time, you know and then you're just exhausted and then play around with an online tool to learn." Dr. H interview, see Appendix 4.

Institution management should pay attention to research papers detailing how an organisation should initiate change in higher educational institution. Lewin (1950) explained that a process of change requires an individual to undergo three stages: the first stage is unfreeze, second stage is change and third stage is refreeze. 'To begin a successful change, motivation for change must be generated'. Institutions have to explain why e-learning is important; highlight the benefits of the system to academics and students and the financial benefits or the reward it will bring to the institution. An example was stated in section 2.10 where the University of Sussex resolved issues of hostility towards the introduction of an e-learning system by an information campaign; they disseminated information using simple scenarios, cartoons and opened dialogues pertaining the benefits and simplicity of e-learning technology. This made hostile academics lessen their hostility and engage with the technology.

The same approach has to be applied to some of the problems academics stated in this research. For example, this research stated that some academics are technophobic; they do not like e-learning technology (see list 4.2, item 23). Others complained that e-learning is complex (see list 4.2, item 8), stressful (item 14), and takes time and effort to learn the technology (item 1).

The University of Sussex is a good example where dissemination of information is approached correctly. The academics who say e-learning tasks are complex may require information dissemination on how easy some of the tasks are in their e-learning system implementation. This would also resolve concerns for academics who say

learning e-learning systems is time consuming and adds pressure, they could be persuaded using the above information campaign.

The unfreeze stage can be achieved by developing a compelling message and explaining why the existing way of using e-learning cannot continue. This is easiest to frame when figures can be applied regarding saving time, creating a better learning experience or developing surveys of student satisfaction.

The change stage should allow academics sufficient time to adopt new practices, and academics should feel they are part of the change process, through the use of frequent communications.

Training should be a big part of the change stage when academics are curious of the technology. E-learning experts should be ready to provide help and individual one to one support if and when required. When academics are stuck the support team should be ready to help by making things easy. This way they will win the hearts and minds of academics making the transition successful.

When academics have adapted to the new practices it is vital institutions refreeze the change process. With the sense of completion of change comes stability; academics would feel confident about the new ways of working and feel secure in the new environment. It is vital for institutions to declare the change process has been successful otherwise it will lead to a feeling of never ending change which may cause reluctance and negativity in the change process. E-learning systems do not have to be portrayed as a constant change of software and instruction; the front end or user interface should remain the same, the back end can be updated to which only administrators have access.

4.3.4 Feedback

5. Additional technology should be provided so feedback can occur more promptly to colleagues and students.

"I should have a mobile notebook put a webcam to give feedback to the students who also would have a mobile notebook with a webcam, I could be in Hawaii on the beach and communicate and give back feedback quicker." Dr. H Interview, see Appendix 4.

4.3.5 Specialist support

6. Ideally academics should not update Blackboard, but notes should be prepared and given to an IT expert to update and arrange in Blackboard according to the academics' wishes. This would ensure uniformity, save time and frustration.

"I would want academics to produce the material but then have a specialist to organise it in Blackboard accordingly." Dr G Interview, see Appendix 4.

4.3.6 Standardise technology

7. Usage of other email applications in combination with e-learning platforms seems to create extra hours of work for academics. One way to reduce the time spent on technology is to reduce the different email applications being used.

"There actually should be something where they can help us to streamline the whole thing" Dr. E interview, see Appendix 4.

4.3.7 Student monitoring

8. A student monitoring system should be included in the e-learning environment. The academic wanted a tool that could monitor students to ensure they check emails and postings so they don't fall behind in their studies.

"It is very difficult to motivate them to use these tools unless they see a value in that, in their assessment. Assessments are becoming extremely crucial to them." Dr S.K Interview, see Appendix 4.

Some of the suggestions on the wish list involve management and protocol issues that does not require a technical solution. These include item 1, the human support, 2 and 3 to manage expectations. Item 4 managing change and variations, item 5 feedback, item 6 academics should not update e-learning platform with content, item 7 standardising email communication, and item 8 student monitoring system. There are already functionalities available within most e-learning systems to standardise email communication that academics may not have been aware of.

Managing student expectations is very important to the successful implementation of an e-learning system with student feedback as suggestion five indicated. Senior managers in institutions need to provide additional support for academics thereby improving management and administration.

Almost all the above suggestions can be resolved by implementing appropriate policies, clear protocols and a communication plan. Suggestion number 6 for institutions to provide technical specialists to help academics with uploading content, thereby reliving academics to concentrate on their other duties, will save academics time and reduce workload. However the institution will possibly bear some cost to provide the additional services.

4.3.8 Usability

9. Assessment should be improved, and included in e-learning. Academics have pointed out that Blackboard assessment is too complex for those who have limited time.

"For someone who finds a Word difficult, Blackboard can be intimidating." Dr G Interview, see Appendix 4.

"Assessment could be improved and that students can have multiple choice of the test without knowing the correct answer, I would like to be able to give them feedback so they can have another go at the test and improve their scores." Dr F Interview, see Appendix 4.

Academics have pointed out they would like to use online assessments more frequently. One senior lecturer pointed out that an academic who finds computers difficult to use will find Blackboard assessment tool daunting. However, whilst doing a technology survey to see what is available in the market, it was found that there are numerous companies and consultants who are specialised in providing online assessment solutions. Some notable ones are Questionmark Ltd, Kineo Ltd (http://www.kineo.com), GL Assessments, BTL and Calibrand. There is even a professional association related to this area: the E-assessment Association. They proactively campaign for wider and more effective use of online assessments.

10. Video feed should always complement learning discussion, lectures and tutorials to reduce confusion, frustration and feeling in the dark.

"They should allow you to create your own library of videos because now I have to carry discs and things to do with other visual things." Dr A Interview, see Appendix 4.

11. The e-learning platform's online help should be made easier to understand. Specifically, the functionality should be easy to understand and operate and it should have more elaborated examples, including help for every screen. It should come with recorded video clips on how to operate the functions, how to record lectures, how to upload items into the e-learning platform, and then a preview of how it will play to the audience.

"To make the technology easier to use." Dr .D Interview, see Appendix 4.

"Some of it is too complicated". "Yeah more inbuilt guidance and I think it's time as well you know as time goes on, we need to get more [confidence] with these things." Dr E Interview, see Appendix 4.

12. Standardise the general Graphical User Interface (GUI) standard and such as menus and links, so all academic staff visualise the same functions. This will help in reducing the complexity issue, by academics finding functional links and applications with ease.

"There is no uniformity and I don't think that's not engaging properly." Dr E Interview, Appendix 4.

Academics stated that the e-learning system should maintain a uniform look and feel; therefore learning technologies should remain constant and not be changed by users. A lack of uniformity adds to the perception that technology is complex.

On a second point, changing the uniformity of the technology requires time from the academics, and requires advance knowledge in using e-learning software. As academics are not web designers, it is helpful to them that the uniformity remains consistent. However having a uniform e-learning system will limit flexibility on user preferences and limit customisation according to different departments and speciality

needs. In this case, the drawbacks of uniformity outweigh the benefits of allowing a greater customisation for the users.

Standardising GUI is a policy issue and not a development issue. Many institutions have a standard GUI implemented. While the technology and the 'know-how' are in existence, direction and policy requires leadership from management. This does not meet the fourth objective to develop a software solution; hence this is out of the scope of this research project.

13. The interface can become more intelligent and friendly. While the present online help is good, for someone who finds MS Word difficult for them Blackboard can be daunting. The intelligent interface has to adapt to the needs of the users, which are in this case sometimes non-technical academics. For example, creating an assessment and linking it to material, content, tutorials and conclusion would be daunting for a novice in Blackboard.

"Interface can become a little bit more intelligent, interface is fairly rigid [assumes] a bit of initial understanding of how the technology works." Dr .G, see Appendix 4.

Creating an intelligent interface is supported by the literature, which will aid academics and fulfil the research's fourth objective, which is to develop a prototype solution. Having an intelligent interface means to develop functions that are easy to understand and designing an interface that users will find easy to use which can resolve problems by pointing to the direction in which help can be sought.

Suggestion item 11 from the academics' wish list emphasises that online help should be more extensive and easier to understand. This should involve putting more thought into the difficulties users may face, considering where help is to be placed, and the terminology used. All these suggestions can be incorporated in one general suggestion to make the interface easier to use, locating help in a place where academics can use it and within a format they like.

Making the interface intelligent will help a teacher use the tool effectively and efficiently making the task of using the system easier. The intelligent interface will have a simple layout with wizards to do most of the tasks academics require. It will consist of extensive help, including a simple layout with video 'how to' presentations with every task. Simple steps such as adding wizards in appropriate places can save academics time and effort in understanding and learning the system.

The academics who mentioned the intelligent interface as a solution are from institutions that have Blackboard as their primary e-learning system. Institutions who have implemented Moodle as their e-learning system, or migrated from Blackboard to Moodle state the Moodle interface is more intelligent, user friendly and flexible (See Appendix 10, document of Middlesex University stating their reason for moving to Moodle).

4.3.9 Dynamic System

> 14. All materials uploaded to the software system by academics should automatically create relevant citations/links to articles, books, and then list them below the uploaded materials. The system should initiate, and be proactive, in creating citation and references to any materials uploaded. Once it recommends citations, links, files or other materials, academics should be able to grade the recommendations (e.g. a 5 star rating for good citation or a 1 star rating for irrelevant links). This way a student will be encouraged to read further on the topic as higher education entails. This 'dynamic system' will teach students how to cite and will encourage academics and students to use the system.

"What the system can do is I don't know automatically to have links or to have a material of the related technology to motivate them to think more than what the teacher in the class in 40 or 50 minutes has taught them. Currently they are sitting to memorise,

the students get that material and then they will try to memorize those words which you have written.

You can call system as an active or dynamic system because now it is just a passive, you go to the system, and you just upload it. There's a lot more for students to explore and they don't do that.

So I'm thinking when I'm delivering the lecture about a topic and that can be initiated by the system to give them automatically the link or direct files from the topics that can help them to explore. The system tells the student this link covers 90%, 100%, 50% of the topic of this field. That grade can be altered by the teacher by putting a star on it so it increases the reliability, it would be an initiative from the system and then the teachers can review or grade". Dr J Interview, see Appendix 4.

Allowing a system to initiate dynamic searches initiated by a trigger which is the upload of content requires a complex software application that integrates a search engine. This search engine is an automatic filtering system that allows filtering inappropriate results and automation between content upload, carrying out searches and filtering the appropriate data. A basic example would be the Google search engine technology with an addition that filters to relevant data.

The Google search engine exists; therefore the recommendation is to merge with a content seeking application adding a filter that is better than the current Google search engine standard and an interface for academics to view results. This suggestion is too complex for an individual researcher to initiate and requires extensive resources which are not present for this investigation. However, this solution would save time and effort for academics, and would encourage students to read extensively in around the subject area of study.

4.3.10 Infrastructure

15. It is necessary to have a resilient network infrastructure. When the network goes down, it is important to have a plan B, i.e. to have a secondary network in place which would take over. This would increase staff confidence and expectations, and also increase network reliability.

"Sometimes the system is very slow that's where the only problem." Dr. I Interview, see Appendix 4.

"Network is down and I don't have access to a module, students don't have access to a module, we are in trouble. If I say to students you can submit your course work online using the electronic drop and the system went down then we have problems." Dr G interview, see Appendix 4.

Improving the hardware specification would also reduce slowness, freezing and crashes. Having a resilient network with a disaster recovery strategy in place and larger bandwidth is an appropriate solution to help academics to save time, labour and reduce the apparent frustration of academics. The technology is present in the market to enable an institution to carry this out. The knowledge to implement this solution is also widely available amongst network and infrastructure engineers; it requires finance and experts to fulfil this objective. This solution would help academics but since technology, expertise and knowledge already exists, there is no need to carry on this suggestion any further within this research project.

The communication network resilience is an issue that concerns network engineers and they have various means of restoring communications with alternative technologies such as leased line, wireless communication and satellite technology. Knowledge-Base Forum is like any other applications such as web servers or even a print server. When communication link is up they will function and when link is down the connection will be lost but the system will be unaffected. The network traffic depends on the usage of

Knowledge-Base Forum and at this stage of the prototype development the traffic and infrastructure issue is not a problem.

4.3.11 Visual Communication

> 16. Many academics use SKYPE to communicate with colleagues, which would have been a useful component for use with Blackboard. If they could have a mobile notebook connected to the internet with video conferencing for communication with their colleagues that would be a useful and flexible addition. The use of a Notebook with a webcam can allow direct feedback to students without being present in front of student but with similar effect.

"To communicate with each other amongst colleagues, the only way online in terms of face to face would be through Skype and that would be sweet if we could do that through Blackboard." Dr. H Interview, see Appendix 4.

Incorporating SKYPE into an institution's e-learning system is an interesting idea and one supported by the literature to aid visual communication when a face to face meeting is not possible. Applications similar to SKYPE will aid communication therefore it will aid academic roles. The hardware and the software tools for SKYPE are available in the market for integration. The disadvantages are that extra bandwidth will be required for the e-learning system and when one piece of software fails such as the e-learning system, SKYPE also will fail. However the bandwidth problem should not be a deterrent as long as high speed bandwidth is available and institutions IT infrastructure engineers are able to provide disaster recovery in case of a system failure. If a disaster recovery system is not in place and bandwidth is limited then this solution has to be considered carefully. The best approach is case by case, where each institution judges its own capability and carries out a feasibility study before implementation.

4.3.12 Training Support

17. Academics who took part in the first set of interviews stated that more training is required for mature academics, especially those who do not use the e-learning technology. They believed that the students who have academics who do not utilise the e-technology perform less well than those academics who have prepared and put up materials in the e-learning technology.

"General e-Learning, I think if they provided more support not in terms of training as in like collateral but more of a customized to different age, if you know what I mean?" Dr. A, Interview, see Appendix 4.

"I think another way would be to for them to explain how we can actually convert our teaching material even to a format that would work better." Dr. E Interview, see Appendix 4.

18. The training should be during usual working hours during term-times instead of in summer holidays.

Training on how to use the e-learning platform is a major concern for academics. The academics that were interviewed discussed the difficulty in how to convert teaching materials into a format that would work better in an online learning environment, and how it will actually appear once it is complete. If a video would or would not work well in the e-learning platform, what is the best way to create video tutorials/presentation and make them uniform, i.e. the colour combination of GUI looks complex or different. An e-learning trainer to show and teach the artistic side of the technology is needed.

The need for regular, adequate, efficient face-to-face training is a management issue, which cannot be investigated within this research time frame. However, having an intelligent interface will help those academics who have suggested item 14. With a more intelligent interface design, academics should require less help, or have a lower demand for training. A system that is easy to use requires less training therefore results in a manageable workload because academics will be able to complete their tasks with ease without getting stuck and looking through manuals, tutorials or spending time seeking help. This also saves time and effort from attending regular training, which is a benefit to both the individual and the organisation.

However for institutions an intelligent interface may mean a cost is involved as many applications exist in the market, which do have simple interfaces that academics can try out. An institution must take a strong position of getting the best application for the job, secondly they must be willing to take on the burden of extra cost to procure the software, and thirdly they must make an investment in labour to install this purchased software, and support and administer it correctly. This would make the academics role easier and allow them to interact effectively, whilst saving them time, enabling them to concentrate on other duties. Institutions will see the benefits of taking a strong stance on having an intelligent interface as it will reduce their training cost. Also, learning will be delivered according to the wishes of the academic because they will be able to understand the technology better, and they will be less likely to incur technical problems. Ultimately the students will benefit with institutions fulfilling their objective of delivering quality education and lead to institutions academic credibility and prestige being raised.

4.3.13 Individual needs

19. The e-learning system does not cater for the needs of foreign students as they may come from different backgrounds and educational cultures which require their learning to be accomplished in a different way. For example, a student from Bangladesh might come with a simple educational background in contrast to a British or a Polish student who comes from a different standard of education. If the e-learning system can identify the individual needs of all students, not just students from the UK but from all over the world, this would be an improvement in the technology.

"I know some of the students are from Africa and other countries, it's difficult for them to be honest and open with us to say this is rubbish and it's not working." Dr. E Interview, see Appendix 4.

"A lady in the classroom who might have come over here from a very simple background in Bangladesh or wherever, her needs will be very, very different from the Polish student who wants to study at the university or is quite sophisticated and I hadn't seen that the technology can cater for that." Dr. K Interview, see Appendix 4.

4.3.14 Health Hazards

20. As the role of an academic is changing, more could be done to notify academics of the health and safety issues of using technology for long periods of time. Appropriate guidance may reduce some of the ill effects.

"It's probably made work more unhealthy in the sense that this things, well probably you're sitting down for too long, so your back ache and so I think maybe to go back to the question that more could be done to teach people about the dangers of sitting front of the computer for too long." Dr. D Interview, see Appendix 4.

4.3.15 Flexibility

21. E-learning systems at present are not flexible. Flexibility refers to different e-learning platforms sharing a common architecture so that work done in one can be moved to another without any compatibility issues.

"We are limited by the specification of the hardware and the ability of the software." Dr D interview, see Appendix 4.

4.3.16 Pedagogical

22. Academics should increase motivation aspects in teaching in an e-learning environment.

"It is very difficult to motivate them to use these tools unless they see a value in that." Dr. T interview, see Appendix 4.

"I think my own teaching style is one where I just feel as teacher every single class is different, every students needs are different and therefore to be an interesting teacher it's an interactive process, where your students needs vary so much say for example in one class, you could have quite sophisticated Polish students and maybe ladies that come from Pakistan or wherever, whose learning background is very different, therefore

as a teacher you have to do a lot of preparation through each student in a way and I doubt a computer can do that." Dr K Interview, see Appendix 14.

23. Social networking aspects should be included in e-learning.

"My idea was to build up the E-journal so that at the end of the day when they revise they have this discussion on board online and it will actually recollect what they are going to learn, it is open, so they can also see other people." Dr. T Interview, see Appendix 4.

4.3.17 Editing

24. The edit facility is lacking in Blackboard. If you upload a document, video or an image that later requires editing, you have to download the file and use the original software to edit it, then upload again and recreate the links. This is problematic for academics. There should be an edit function to edit the document at least for the mainstream software articles so it will save time for academics.

"I've always found it frustrating and difficult is you can't edit things on Blackboard you have to delete it and reload. You have copies and so you delete it, you edit it and then you put it back on again - I would change that. I would make the blackboard able to edit and change on blackboard rather than to remove and put back." Dr. A Interview, see Appendix 4.

The editing suggestion will definitely will help academics. However, this requires a complex solution as there are many types of documents and different versions of media

that are incompatible. Designing a function enabling all of them to be edited in the e-learning software could have legal implications as vendors may not allow other software products to edit their document formats. The solution for this problem lies with e-learning vendors inviting other software makers to make their software compatible.

4.3.18 Interactive Whiteboard

25. Interactive whiteboard to be used with Blackboard as a whiteboard has memory storage capacity. At present Blackboard is not currently used with Whiteboards as stated by the academics interviewed.

"Interactive Whiteboard that you can store all the information in the computer and would be a good idea in certain circumstances." Dr. B Interview, see Appendix 5.

Interactive whiteboard is a shared working space, supporting collaborative learning. It is an instructional tool that allows electronic images to be displayed onto a board using a projector. Academics can manipulate the content on the board by using a pointing device, or finger as a mouse directly on the screen. Items can be dragged, clicked, copied and academics can make handwritten notes. The whiteboard can be used by learners to interact and the sessions can be recorded and played back at a later date. Interactive whiteboard technology is widely available in the market, notably Adobe Connect and Blackboard Collaborate provide an interactive whiteboard facility integrated within the e-learning system.

Various other interactive whiteboard technologies external to the e-learning system are also available including mobile phones and tablets that can be used as portable interactive whiteboards. Educreations and Padlet are such portable applications where learners and academics can create drawings, diagrams, text, images and videos then embed or link them into an e-learning system.

Therefore this recommendation does not require software development rather an interactive whiteboard can simply be purchased. Alternatively institutions can purchase the licence for Blackboard Collaborate. The downside to this would be a cost issue for institutions to purchase the software and implement in their e-learning environment.

4.3.19 Authority

26. Blackboard does not have controls for the authority of academics in the discussion rooms so their presence is not felt.

"Most of the students would ask questions over email and have it done - so you do need that rather than face to face contact. So you lose staff student relationship I think it's important to build that, well I don't want to be a faceless teacher. I think technology does take way some things." Dr. D Interview, see Appendix 4.

Having authority in a discussion board requires super user privileges to be given to academics. When academics are writing, their words should be formatted in a way that stands out from the rest. Hence, it is a policy that can be implemented to allow academics to have authority. Current e-learning platforms allow this feature but require technical administrators to work with academics to ensure academics stand out amongst other users and students.

Academics prefer the teacher centred approach to learning, where the focus is on the teacher to disseminate instructions. The teacher feels in control when students face them; this also has the advantage of bringing order in class when students are not listening, or are doing incorrect things. Another important aspect to this is that the teacher is visible; authority allows the teacher to aim for a common goal.

In class room settings, the teacher can observe the facial expressions of students such as blank faces, confusion and a restless audience. This direct feedback makes the

teacher aware that the lesson plan needs to change. In an e-learning environment this is limited to only written feedback.

E-learning depends on learners being proactive with minimal supervision. This suits autonomous learners, the students who are good at self-management, but learners who are less autonomous require a teacher figure guiding them in every step. Academics are a representation of authority, guidance, motivation and encouragement. A learner centred approach weakens authority of the academics especially in an e-learning environment where physical presence of academics is absence.

Academics have control in face to face learning environment because they control the selection of content and sequence it. This could also apply to the e-learning environment if academic control topics and responses on the discussion forums. This would enable academics to manage student interactions effectively.

4.3.20 Miscellaneous

27. Removing the mouse and the keyboard can save time and operating effort. Instead, instructions can be input by voice.

28. If the institution allowed academics to use open source software, this may be better than using the standard e-learning platform forced on them by their institution.

"I don't know, they're very robust, so you see it's not necessarily evident why one has to use windows." Dr H Interview, see Appendix 4.

" I think that if we were all free to use whatever open source, but I don't have a choice because the university have a licensed Microsoft, we've got to use Microsoft windows and office" Dr D Interview, see Appendix 4.

"I think that if we were all free to use whatever software we want to use life could be a lot easier like with the open source Linux software." Dr D Interview, see Appendix 4.

29. Make Blackboard similar to BBC Learning by adding more functions such as advice and tutorials for students and staff. Here the academic interviewed is referring to the BBC website where every subject introduced has a learning presentation then an interactive presentation where the student is required to participate. Quizzes are used to test the student followed by an assessment.

"More support yes and more relevant technology if I can see for example something comes up on that fantastic BBC website obviously it is great and I use that because I could see its relevance to what I'm doing." Dr K Interview, see Appendix 4.

30. The e-learning system is not required since the traditional system of face to face classroom instruction is sufficient.

"Personally I don't like WebCT or Blackboard, call me traditional but I do feel that teaching should be face to face contact, not behind the mask of wireless computers, they have improved many aspects of life, they've taken way a lot of personal touches from life" Dr D Interview, see Appendix 4.

Replacing the mouse or keyboard with a voice-activated system is a very desirable and ambitious project. However the capability or the technical know-how to investigate this solution is out of scope for this research.

Allowing academics to use open source software is not a problem in all institutions. Many institutions allow the practise and are relaxed in their rules. For example, Middlesex University allow any software to be used to aid teaching as long as the instructor is familiar with the technology and it brings about benefits in student learning. However, investigating this area will not resolve the stated objectives of this research.

Advice and tutorials are hard to standardise. Each institution has its own requirement and this is a broad suggestion. Current e-learning platforms have the capability to copy or do similar things as the BBC website.

Belief that the e-learning system is not required is a minority view. Some academics have this view, but from my discussion with them it seems they mean that e-learning is not necessarily required to improve learning, but it is required for organising, accessing materials, and online secure storage.

4.4 Outcome of academics' suggestions as solutions

The wish list made by academics in section 4.3 gave suggestions that would help academics with their use of e-learning systems. Suggestions that require the removal of the solution in existence, or those that do not require a technical solution will not be considered in this research, as they will not meet the objectives of this research.

The following suggestions have existing solutions in the market which are available to the institutions to purchase and install. Therefore they will be discontinued from any further investigation:

1. Student monitoring system to utilised by institutions

2. Video and images should be incorporated with lecture design by academics

3. e-learning systems are not flexible and do not share a common architecture

4. Social networking aspects to be included in the e-learning system

5. Interactive Whiteboard to be used within e-learning system

6. Institutions should allow open source software rather than restrict to an institutions preferred e-learning platform.

7. E-learning assessment, various applications are in existent in the market that allows for better assessments and easier to use.

The following suggestions relate to policy, management, learning, pedagogical issues, technical support and managing expectations. These suggestions are appropriate for management and education researchers; therefore the following suggestions were discontinued from further investigation in this research project:

1. Human Support

2. Management Support

3. Pedagogy

4. Organisational management

5. Resource management

6. Student expectations

7. Technical management

8. Training Support

9. Individual needs

10. Health Hazards

11. Flexibility

The following suggestions remained; they have been compared with the top 5 disadvantages of e-learning software as outlined by academics in the first set of interviews. Making this comparison helped to generate a solution which would solve some of the problems that academics mentioned, as well as fulfil the research objectives of this study.

1. Additional technology required for better feedback.

2. E-learning assessment should be improved.

3. Inclusion of edit function to manipulate online content.

4. Interface should be improved and can be made more intelligent.

5. Academic content to have automatic citation of links when content is uploaded.

6. Individual needs.

7. Removing mouse and key boards.

8. Visual Communication; SKYPE to be incorporated within the e-learning system.

The edit function cannot be carried out as the resources and authorisation to investigate the code of Blackboard, desire2learn and other e-learning systems are protected. So this solution cannot be further investigated and needs to be addressed by vendors themselves by coming together, as they have done with common cartridge which allows different vendor e-learning systems to share content.

The individual needs suggestion is a pedagogy issue and appropriate for educational researchers to specify criterion to recognise the individual needs of a student before a technical solution can be investigated.

Removing the mouse and keyboard is a good idea but complex to carry out. The required resources, expert knowledge and time is not available for this research therefore this suggestion will be discontinued.

Therefore there are three solutions remaining which could be developed to meet the objectives of the research project: Friendly Blackboard E-assessment, Visual communication and creation of automatic citation and reading lists. These will be discussed in the next section, and one will be selected to be developed.

4.4.1 Friendly E-assessment

Academics would like to see Blackboard's online assessment functionality used more. They stated it was daunting and difficult to use. Adding an intelligent interface, having a variety of templates in place and including an intelligent wizard that can guide users in creating their own assessments would be helpful. The interface could be improved so any article uploaded could be edited without downloading it first.

In the interviews academics stated that e-assessment is complex to operate, however they suggested that one of the ways to help them would be to create an easier,

friendlier assessment system, with an interface that would enable them to assess their students. Therefore academics are looking for innovative ways to assess their students.

From the interview data it is evident that institutions are trying to encourage the use of e-assessment therefore the obstacle to this aim is the complexity of e-assessment. Academics have stated that because of complexity they are put off the e-learning assessment but are willing to try if things were made easier, and adequate training and support was available. Additionally, e-assessment is a cost saving measure for institutions as it reduces printing and could be simpler to organise and administer thereby saving costs associated with staff time.

This solution could also help with the training category of suggested changes to e-learning. If online assessment could be simplified then it could mean less technical support is required for academics and that will help with time-saving in regards to training demands.

4.4.2 Visual Communication

Integrating blackboard with SKYPE and web cam gives freedom and flexibility to staff; this is noted in wish list item 15. Academics could remotely provide student feedback on camera by discussing, answering questions, and clarifying any matters raised by students. This would help to address the issue of loss of face-to-face contact with students.

This solution gives a lot of flexibility to academics, which may reduce some pressure on having face-to-face appointments. This solution may also introduce some technical problems, since operating SKYPE, with camera and a discussion board as three separate technologies combined into one, may lead to more technical problems and the need for more training.

A problem discussed in section 4.3.11, that extra bandwidth would be required for an e-learning session with SKYPE incorporated, as real time video communication requires extra bandwidth. A further disadvantage is that embedding SKYPE increases the chance of e-learning system failures, increases the potential for connectivity loss and involves spending time in getting connected and thereby could increase calls to a technical support department for help. Should one piece of software fail such as the e-learning system, SKYPE also will fail with it or vice versa.

Another ramification to this solution is that it is real-time interactivity which would lead to an increase in workload as expectations upon academics from students and institution management would potentially rise. Academics would be expected to provide support out of hours. Embedding SKYPE into e-learning systems would therefore increase the workload pressure on academics.

4.4.3 Knowledge-Base Forum

The concept of Knowledge-Base Forum is wish list item 14: the creation of automatic citations, references and reading lists in an e-learning system. If this suggestion was implemented, it could save both academics time and effort. Having content provided by expert authors will mean that academics do not have to spend hours developing this themselves. This will allow them to have reduced working hours, and also spend their time completing their other duties. The concept of Knowledge-Base Forum will provide an opportunity to improve academic interactions with e-learning software, whilst ensuring that their workload does not increase further, but instead saves them both time and effort.

1. The concept of Knowledge-Base Forum could also improve creativity and quality of the students learning. Where students are psychologically limited, the Knowledge-Base Forum system will encourage them to read additional material thereby improving their learning. For academics this will again save time so they can concentrate on teaching and their other duties.

2. Additionally, Knowledge-Base forum can be an additional support to academics in regards to extra resource, when academics are stuck in terms of research and help is not available, then this application can be used to seek expert knowledge.

The creation of automated citations and reading lists could provide academics with a functionality that does not exist in current e-learning applications; specifically it will help when uploading materials. Academics would not primarily concern themselves with suggesting reading lists as they would know the e-learning system would analyse the uploaded text and find relevant citations, by creating a reading list with a marking scheme. The marking scheme would suggest citations with ranking of importance to their topic. This would encourage students to read the materials as they would think it will be important for their course, which will help students to become more creative and give academics time to do other important tasks.

Since the topics of research articles are put onto the portal, which can viewed by a wide audience, a publisher can write something about the subject being taught and may be able to provide newer, more up-to-date information on the subject, than if the academic were to write the article themselves. Academics could also request help when expert knowledge is not available; this could be invaluable to higher education institutions because it would be an additional resource for academics.

4.4.3.1 KBF supports shared learning

The analysis of academics' preference of an e-learning system shows that academics have no particular preference for one e-learning platform over another; rather all the platforms are viewed as similar. However, all academics encourage their students to use the internet to do some research. They encourage the use of email systems and one academic specifically pointed out that he encourages his students to pass on interesting materials relating to other students. This is a support for wish list item 14, the Knowledge-Base forum. This suggestion tries to create a knowledge-based community and actively encourage posting and research by students for self-learning. The Knowledge-Base Forum system is described in section 5.4 and section 5.5, Appendix 11 contains step by step of Knowledge-Base Forum functionality.

4.4.3.2 Knowledge-Base Forum will not confuse academics

The analysis showed Blackboard is a popular system so any solution should be compatible with the Blackboard system. Academics do not distinguish the different components that are put together to make up the e-learning system. They see the Blackboard system, email system, Internet web pages, the multimedia tools for recording images and videos, and even sometimes Microsoft Office, PowerPoint and other applications as the same entity (i.e. for them, all those entities listed above make up the e-learning system). This demonstrates that developing a separate application package will not create confusion as long as there is a link to the new application. Academics are used to viewing and working with a variety of applications for the purposes of learning.

4.4.3.3 Knowledge-Base Forum will help with learning

The belief that students copy and memorise notes made by academics is a learning disadvantage which is hard to deal with, but proactive students are less likely to copy and paste as they are the ones who understand the subject, usually do their required

reading and research the topic of study further. The Knowledge-Base Forum solution tries to foster an atmosphere encouraging pro-activity and further reading among students. This solution can be beneficial to students and academics. They can post assessment topics and core subject materials that a student needs to know. These topics will be of interest to students so they will have a reason to check the postings. This will save academics time and effort, as normally some of their time is spent encouraging students to read interesting materials in connection to their course.

4.4.3.4 Knowledge-Base Forum will help to re-engage curious academics

One disadvantage mentioned by academics teaching Law is that current e-learning platforms do not provide the latest legislation drafted by Parliament. There is a web portal http://www.legislation.gov.uk which provides this information that can be linked to the Knowledge-Base Forum solution. The academics can query specific legislation and its impact on current laws. This may encourage academics, such as the one suggesting the problem, to try out the system. This point supports the Knowledge-Base Forum solution as it requires links to different applications relevant to academics needs, and links to online communities who are experts and relevant to academics.

4.4.3.5 Knowledge-Base Forum resolves many listed disadvantages

The analysis of advantages and disadvantages of e-learning systems was broken into various categories; eight categories were identified to effect academics directly. The two most notable categories were increased work hours and technical problems. The analysis showed that working hours had increased due to online learning: four out of twelve academics felt they spent too much time on e-learning systems, eight said they felt that they spent a satisfactory amount of time using the systems as most of the time was spent on research, email communication and preparing materials for the e-learning platform. Academics had always spent time on research before the introduction of e-learning systems, except that e-learning has saved lot of time by having electronic

access to research materials. This is a lot less time-consuming than searching for hard copy materials and other data in libraries. What's new is the time spent on online course material preparation, participating online in discussion forums and email communication.

A Knowledge-Base Forum solution could help reduce hours spent on writing materials; since the topics of interest could be proposed and expert authors could contribute content to any requesting academic. This would save time for academics so they could concentrate on their other duties.

The Knowledge-Base Forum solution will help with course material preparation by giving it to the wider community for input; as a consequence academics will save time on research activities by enlisting the help of a wider community.

The Knowledge-Base Forum community can be described as a group of people defined by participation to help academics to engage in and promote content creation for learning. Administrators and professionals from all fields would form the Knowledge-Base Forum community. The participants will be authors, learning technologists, academics, students of knowledge, and scholars of all specialities in sciences and arts.

Academics use their students to undertake investigations and research, so why not upgrade this help, by putting their research needs to a wider community and allowing other academics and professionals to contribute. This will, no doubt, help academics.

An important distinction exists between Knowledge-Base Forum and other content contribution sites such as YouTube and Slideshare. The distinction is Knowledge-Base Forum academics request the content required, specify the credentials of the contributor and assigns the contributor whom the academic deems appropriate to take on the task. Other content contribution sites such as YouTube and Slideshare, no condition exists to be a content request site, there is no condition that contributor has to have credentials

or allow submission of proposals. Lastly users do not choose who provides the content but in Knowledge-Base Forum academic choose the contributor.
Email communication does take time, and though the tool is new, methods of communication have always existed between academics, including having to write letters which is a more time consuming task. Therefore, writing job requests as part of Knowledge-Base Forum should not add to academics workload in this respect.

4.4.3.6 Knowledge-Base Forum over SKYPE

The technical problems category is where the most disadvantages lie. Implementing the visual communications solution will create the most difficulty, as there will be a merger between video and audio on the computer linked by a network. Although very useful and high quality computer purchases come with video and microphone attached to the computer, this solution can be expensive, will probably create more technical problems and require more training support.

Implementing the Knowledge-Base Forum solution is not an error free task, nor immune to technical faults; but it is likely these problems will remain at a minimum, as it requires only the network to transmit data and can work without the audio or video component working. So the suggestion of a Knowledge-Base Forum solution would likely solve more problems, in comparison to suggestions of friendly E-assessment and visual communication solution.

On the point of adding pressure to staff, academics who are reluctant to use technology may try avoiding the system. The more the institution tries to encourage e-learning use, the more pressure it creates on academics resulting in stress and frustration. The solution for the institution is to introduce change slowly. For instance, having SKYPE introduced now, may be too early as it may result in unexpected ramifications such as training needs and technical problems.

Implementing the Knowledge-Base Forum is more suitable, since there is less pressure to use the system, as one academic mentioned *"we do not force rather encourage"* (Dr DR G, see Appendix 4). It will not interfere with academics' work if they don't use the suggested application; rather if they learn the use of it, the potential benefit will be huge which will encourage further use.

The use of SKYPE as a communication tool may be adopted by universities as the standard tool for communication, but because of the disadvantages associated with its implementation, nervous academics may resist this change. This will lead to opposition towards senior management, thus disrupting the working environment. This can be seen from a statement made by Dr. K : *"Some of us will withdraw even more if we feel there is pressure, pressure, pressure",* see Appendix 4.

4.4.3.7 Reduce red tape

The red tape category of disadvantages related to e-learning technology, where academic's presentations for e-learning are verified and checked before being uploaded to e-learning systems exists within some institutions, but not all. This point is more relevant to communications and standards, which is not a core concern of this investigation. In the point where more repetition is being done by announcing, emailing, publishing on the web site and discussion forums, again may be within specific institutions. All this can be resolved by enhancing standards, procedures and protocol, which does not require a technical solution. The Knowledge-Base Forum solution reduces time spent in dealing with many problems, so in this scenario where time is critical this solution is helpful.

Getting students interested in using the Knowledge-Base Forum application will no doubt lead to a reduction in classroom announcements as they will get to hear it through this medium. The Knowledge-Base Forum can help in this scenario with the open approach to problems; it will encourage students to use the platform to see what

academics are talking about. The recommended books and articles to read with rating as to their importance will encourage students to use reading announcements. The level of student engagement with Knowledge-Base Forum is uncertain as students are motivated by various factors and the forum has not yet been piloted; however this application is another tool academics can use for their announcements.

Regarding loss of creativity and quality, two points were raised: academics becoming facilitators rather than good teachers, and teachers becoming less creative because of e-learning technology. These issues have no correlation to prove that usage of e-learning system reduces creativity and quality. However, it can be said that institutional policies, rather than technology, are making teachers become online facilitators and uncreative. Facilitating learning in reality is an important part of an academics role; they are facilitating students to help themselves.

There are a number of health hazards associated with using computing technology, such as Repetitive Strain Injury (RSI) which results from repetitive tasks such as typing. These repetitive tasks can damage muscles, tendons, and nerves in the neck area, and will always exist with the use of technology.

Issues relating to stress and frustration are a matter of the individual and institutional protocol, policies and management. If academics are trained appropriately, shown the benefits of the technology and shown simplicity in its use, then it will reduce their frustration and annoyance. Individuals have to become aware of health risks associated with computing technology and learn ways to minimise the risk to one self and avoid any pitfalls that lead to these conditions.

4.4.3.8 Knowledge-Base Forum will aid academics in busy periods

Academics identified that the two busiest times in their academic calendar are the beginning time of a term and during the assessment period. The assessment period is busy due to time being consumed with marking. The beginning of term involves a lot of administration, meetings and preparation of course materials. The Knowledge-Base Forum solution helps with the development of course materials as identified earlier, thus helping academics reduce stress and time in a very hectic environment.

Knowledge-Base forum will educate students to acquire a self-help approach. The Knowledge-Base Forum will be able to help in reducing online activity as it will encourage students to learn through a self-help approach. It will allow the wider community to participate and write articles, documents and content for staff. It will allow the wider community to help academics in their research activities, as it has been known that academics often use their students to research or find references for them. The Knowledge-Base Forum will help academics by providing them access to a larger audience from which they can request assistance.

4.4.3.9 Knowledge-Base Forum will be embraced due to being effective

Almost all academics attended some form of e-learning training. Only one academic did not as he personally dislikes technology although he had been requested to attend training. The results of the interviews show that academics usually attend e-learning training as they know it is a useful tool, or at least that it is a tool that has to be learned in order to do their job. This means a level of E-Learning technology is tolerated; academics will make an effort to attend training and use technology when they perceive it as beneficial. Both solutions, the use of SKYPE in Visual Communication solution and Knowledge-Base forum, will not be abandoned because of complexity, but will be used due to the effectiveness of the tool.

4.4.3.10 Knowledge-Base Forum requires training

Two thirds of academics said the training was adequate and that they did not need any further training. Most of these academics were from departments teaching business, engineering and technology; these subjects usually involve lot of use of computing therefore these academics were proficient computer users. However institutions should be very careful as not to interpret these results on majority bases. It is well known that when budgets are tightened to reduce expenditure, the training budget is one of the first to be cut or drastically reduced. Institutions reduce training by reducing the number of hours per course. For example, a training course which normally lasts for a day is cut down to few hours, reducing hands on experience, instead giving an overview and providing online documentation or tutorial to fill in the gap. This is fine and adequate for the technical academic but not so to others whose field is not technical or finds technology hard to grasp.

For all of the three solutions proposed (Knowledge-Base Forum, friendly E-assessment, and visual communication) adequate training would be required. Responsibility for training has to be placed with institution management by discussing the needs and abilities with academics.

4.5 Conclusion

The data collection results have shown the many disadvantages that have affected academics in negative ways as listed in list 4.2. The negative points are longer working hours for academics, e-learning technology is changing academics' roles, inefficient and ineffective training provided by institutions, and academics are frustrated and annoyed with e-learning technology. Academics have said learning how to use the e-learning system takes time, since all learning requires time; this can be minimised by having an application that is easy and simple to use. Therefore, the prototype must be easy to use and understand. The analysis of data shows academics have no preference to the type of e-learning application they use, however, Blackboard is a popular system in UK institutions, and since it is web based the prototype will also be web based.

In a wish list comprising of thirty suggestions by academics as listed in section 4.3, most of the suggestions are to improve support, communications, training and suggestions on improving technical aspects of e-learning application. When this wish list was compared with the negative points, it was concluded that there were three solutions that were practical and helpful for academics. The three suggestions were to create a Knowledge-Base Forum, friendly E-assessment and a tool for visual communication as listed in section 4.4.

Out of the three suggestions, based on the discussion that took place in section 4.4.3, it was concluded that Knowledge-Base Forum was the appropriate application to develop as a prototype. The primary reason for why Knowledge-Base Forum was chosen was because it resolved five categories of disadvantages; it is a tool that solved more problems than the other suggested solutions.

In the literature review, documents from Middlesex University showed that they are migrating from Blackboard to Moodle due to cost saving. The documents also showed that Blackboard is not flexible and is slow to respond to the changes in the education market. There are a lot of free applications that are beneficial to academic staff but

Blackboard is not providing the flexibility to incorporate them (Middlesex University, 2012, internal document written by Centre for Learning & Teaching Enhancement (CLTE) on Migration to Moodle from Blackboard, see Appendix 10). This suggests a potential for free web based application to be used in institutions that saves cost and workload.

The next chapter will trial the Knowledge-Base Forum prototype with four academics from Middlesex University. The results of the trial will be discussed and analysed to show the success of the prototype.

Chapter 5 The analysis of piloting the e-learning Prototype: the Knowledge-Base Forum solution

5.1 Introduction

Chapter four laid out the results and analysis of the insight that was collected to explore academics' perspectives, and thus met research objectives one and two: objective one was to identify the effects on academics and objective two was to identify changing requirements to academics' roles caused by e-learning. Objectives three and four were to develop a framework for a technical solution, to develop a prototype identified from the effects of e-learning interactions on academics and their changing role that required support. Chapter four discussed the various possible solutions and suggestions that were deemed to be effective in meeting the changing requirements of an academic role that would be of benefit to academics.

This chapter starts with mapping the interview data to the prototype, and then moves to a market research section which highlights a gap in the market for Knowledge-Base Forum. Thereafter a framework of the prototype and step by step navigation of KBF will be laid out. Lastly a discussion based on the trial of the prototype will take place.

5.2 Mapping the findings to the prototype

Chapter four we saw the narrowing down of 30 suggestions to three feasible solutions:

1. Knowledge-Base Forum solution; development of an application that would create link to material.

2. Creation of a better interface for the current online assessment tool using an intelligent agent.

3. Development of an integrated e-learning application with SKYPE and Webcam giving flexibility to staff.

Discussion in Chapter four concluded that the Knowledge-Base Forum solution would be the appropriate resolution to aid academics in their role. This solution matched the literature review and is supported by interview analysis on the following points:

1. The time factor; as online activity is increasing, academics' working time is also increasing.

2. The software should be easy to understand and operate, as this will save time and training requirements.

3. The application should give control to academics, with a focus on what they need, not what others think they need.

The analysis of academics' preference of an e-learning platform in section 4.2.1 shows that academics have no particular preference and they encourage their students to use the internet for research and pass on interesting materials to their fellow students. This supports the Knowledge-Base Forum; it holds a repository of information which will benefit staff and students alike.

The analysis showed Blackboard and Moodle are common platforms; since they are web based solutions the Knowledge-Base Forum can be linked to them as it is also a web based application.

The copying and memorising of online text is a disadvantage according the interview results, but proactive students are less likely to copy and paste as they are the ones who tend to understand the subject. The Knowledge-Base Forum solution tries to foster an atmosphere encouraging pro-activity and further reading among students. This solution can be beneficial to students and academics. Academics can highlight

interesting topics that will benefit students. This will save academics time and effort, as normally some of their time is spent encouraging students to read interesting materials in connection to their course.

The analysis of the interviews suggested that working hours had increased due to interactions in an e-learning environment: most of the time was spent on research, email communication and preparing materials for the e-learning platform. The Knowledge-Base Forum solution will help with course material preparation by assigning to a wider community for contribution, as a consequence academics will save time on research activities by enlisting the help of a wider community.

The Knowledge Base-Forum community discussed in section 4.4.3.1 and 4.4.3.5 can be defined as a group of people coming together to aid and engage with academics, promoting content creation for learning. They are administrators and professionals from all fields of speciality forming the Knowledge-Base Forum community. They include authors, learning technologist, academics, students of knowledge and scholars of all specialities in sciences and arts. Literature supports (see section 2.7) the new trend in e-learning of forming online communities for successful learning which Knowledge-Base Forum would take advantage.

Academics have pointed out that extra time is required for writing clear course materials. The Knowledge-Base Forum definitely helps with this as community members can contribute to presentation of materials.

The Table 5.1 shows key points gained from academics interview analysis that Knowledge-Base Forum will address. It takes into consideration the control aspect to searching for data in the search engines, the time academics are spending and how Knowledge-Base-Forum will help reduce and that academics prefer a simple system that is easy to use.

Table 5.1 Showing the core points from the interview and how Knowledge-Base Forum provides solution to these points.

Academics issue	**Knowledge Base-Forum will help**
Too much time spent on e-learning	Contribution of content will save academics time.
Credible information needed	Provides repository of information that can be accessed by a search function
Need a community of knowledge experts to help with specialised topics	Knowledge-Base Forum community brings experts to aid academics.
Academics to be in control of topic and content required	Knowledge-Base Forum only allows academics to request content; academics specify their requirements and have the final say whether it meets their demand. This ensures academic control.
Application should be easy to understand, easy to operate.	Piloting by three academics of Knowledge-Base Forum shown in table 5.3 that it is easy to understand and operate.
Web based application that can be linked to Blackboard and Moodle	Knowledge Base-Forum is a web based application that can be hyperlinked from and website or application.

5.2.1 Crowd source knowledge

Knowledge-Base Forum is reliant on participation of its members to contribute content. There are various online communities including wikis, blogs, and crowd sourcing sites where contributors freely offer advice, time, and investment for general benefit to the online masses. Key examples of some of the success stories are Wikipedia, Usenet, Slide share, YouTube and Facebook. These examples show clearly that free contribution is a reality and occurs all the time online. However this is not without doubters; even some of the people who initiated Wikipedia doubted that people would participate (Bryant et al., 2005). Time has shown the success is very real. Researchers have stated why online users contribute: for recognition (Kollock and Smith, 1999); and for a sense of community and altruism (Smith, 1992). Nupedia, an earlier version of Wikipedia, designed for credible articles written by experts produced out of a peer review process shows a need for credible content. One of the reasons Nupedia was discontinued was because of the long-time taken for the peer review process and slow production of materials.

Knowledge-Base Forum can be seen as following on from the Nupedia approach, however the validation and review is left in the hands of the academic who request content and bidders bid to provide content. The bidding process does not involve money rather the desire to contribute is due to altruism, recognition or for the sense of community.

Crowd sourcing was discussed in section 2.8, the method of crowd sourcing has many benefits and challenges however it can result in the success of the Knowledge-Base Forum. Some of the major challenges of crowd sourcing and how it can be resolved:

1. A challenge of Knowledge-Base Forum is to develop a trusted source that underpins the reliability of the contribution, secondly not all processes and knowledge best suits the crowd sourcing method, for example, codified knowledge is easier to process and verify whilst the information gathered in the

Knowledge-Base Forum may be considered too complex and specialised for the crowd sourcing method. The Knowledge-Base Forum would seek specialised knowledge however crowd sourcing will be suitable: because the requester for content would be an academic, someone who has a degree of knowledge within the subject matter, therefore verification is possible. The contribution is not always sought from many contributors but a specific and proven expert with credentials. The trustworthiness is also verifiable as membership of the Knowledge-Base Forum will be academics, authors and experts within different fields.

2. Crowd sourcing requires marketing to create awareness of the project. To market Knowledge-Base Forum will take time and finance. However it can be said with time, investment and constant marketing campaigns a reliable network of contributors would be generated and awareness of the project would be created.

3. Defining the clarity of the request and the quality of the contribution is not a complex or difficult for Knowledge-Base Forum to resolve. As the academic requester would highlight the experience of the contributor, the level of expertise required, approve the final author who would contribute, and it would not be open for everyone to contribute but selected bidders. The contribution will be detailed according to the requesters need. The final contribution will be verified by the requester if it meets the expectations.

5.3 Market Research

A market research analysis was carried out in July 2012 and October 2014 that concluded no similar product existed in the current market that would resolve the above problem.

Searches were conducted of the following United States Patent Office, UK Patent Office and European patent web sites:

http://www.ipo.gov.uk/types/patent/p-os/p-journal/p-pj

http://www.uspto.gov/

http://worldwide.espacenet.com/advancedSearch?locale=en_EP

On the IPO and USTPO patent websites, searches were conducted using various key words, narrowing the search down to forum based applications. The searches failed to find any products or applications similar to Knowledge-Base Forum, a system for content request using bidding to benefit academics, see Appendix 8 for examples of how patent searches were carried out.

The European patent website search 'espacenet.org' contains 80 million registered patents documents from worldwide that allow simple search facility using keywords to display patents. Patents searched using following key words:

Academic requesting content

Academic requesting materials

Academic content request

Content search

Bidding for content

Supply content

The market research also looked at the Crunchbase.com website, a repository database that has information on hundreds of thousands of companies:

http://www.crunchbase.com/

The same key words were used as the patent searches; these searches did not find any company providing the same or similar software as the Knowledge-Base Forum. However there are websites that exist in the market that help with content searches and repository of content that academics can use, these are listed below:

1. Slideshare.net

   Slide Share is a hosting service, which allows users to upload, view and share their presentations with other users.

2. My Plick

   My Plick is a hosting service, which allows presentations to be uploaded and shared with users.

3. Slide boom

   Slide boom is an online hosting service, which allows the sharing and uploading of presentations.

4. Slide Serve

   Slide Serve is an online web hosting service allowing sharing and uploading of presentations.

5. Google Scholar

   Google Scholar is not designed for creation of content. It is extensively used for searching credible content, finding citations and popularity of published content.

These applications are for general use; with the exception of Google Scholar which contain certain level of credibility. The other mentioned websites such as Slideshare.net, Myplick, Slid Serve and Slide boom are open to all users of the internet

not specific to academia. They are for general internet users, have no access control, therefore the content held is unreliable and anyone wishing to upload content can do so without a credential check.

5.3.1 Academics' wish list compared with available e-learning tools

The five websites described: Slide Share, My Plick, Slideboom, Slideserve, and Google Scholar; including institution preferred system Blackboard and Moodle; and the prototype Knowledge-Base Forum. The e-learning technologies are compared against the academics' wish list in Table 5.2 below. The purpose of this table is to show which system is able to meet the academics' wish list items.

g wish list items against E-learning systems and websites that are useful for learning purposes

	Moodle	Blackboard	Slideshare	Google Scholar	KBF	Slide Serve	My Plick	Slide Boom
	✓	✓						
	✓	✓						
	✓	✓						
	✓	✓						
	✓	✓	✓			✓	✓	✓
	✓	✓						
					✓			
		✓						
	✓	✓						
	✓	✓						
	✓	✓						

Table 5.2 shows some of the features of Blackboard, Moodle, Google scholar, INF, Slide Share and other websites that are available which can help with academic wish list items in section 4.4.

Google Scholar allows for searching articles that link from institutions and journal database literature, once content is published and available for internet users. Google Scholar accepts an advance search that allows a date range, type of domain and author name. Similar sites such as NIF literature allows the same searches as Google Scholar but also more advanced searching using semantic expansions that brings richer data, enabling the user to see discussion and references in social media such as Twitter and blogs. Blackboard and Moodle do not have the same facilities as Google scholar or NIF database.

The e-learning systems and websites listed in table 5.2 do not facilitate user request for content creation that is made available to its subscribers and users with the exception of Knowledge-Base Forum (KBF).

Blackboard and Moodle have the facilities to support some of the academics' wishes as shown in table 5.1; however they are only as effective as academics proficiency of the e-learning system use or the technical administrators who are managing the system. Blackboard and Moodle features are different to Knowledge-Base Forum. The intention of Knowledge-Base Forum is not to produce or achieve the same functions as Blackboard or Moodle, rather to contribute something beneficial that current learning systems do not possess.

Slide share, My Plick, Slide Serve and Slide Boom sites allow users to upload and share presentations, webinars, documents, and videos. This is similar to Knowledge-Base Forum where members upload content however they do not have the facility for content creation requests as Knowledge-Base Forum does.

5.4 Objective is Proof of Concept

The prototype objectives are to overcome difficulties faced by academics by searching for correct content, by enhancing community based learning, creating a central place for academics to request content and creating a central place for academics to view related course content. The content will be rated in quality and relevancy that will produce a knowledge repository for academics; and development of an application system that is efficient and user friendly.

This is a proof of concept pilot, an opportunity to demonstrate and trial Knowledge-Base Forum with small number of academics. This pilot informs the next phase of improvement which would be a beta development. This pilot will confirm whether the idea of Knowledge-Base Forum is worth pursuing and further improvements that are required.

This pilot informs faults with Knowledge-Base Forum and helps with modification to improve the Knowledge-Base Forum. It is legitimate and cost effective way to get feedback prior to a full scale development followed by a stronger test with many participants. It will determine if the academics' wish for content provision is worth pursuing before any further development and stronger testing takes place.

The result of the pilot is an evidence of Knowledge-Base Forum's value. This study proves the concept of Knowledge-Base forum for beta development and improves the current version.

5.4.1 Knowledge-Base Forum proposal

The prototype design is taken from academic's suggestion wish list item 14, the Knowledge-Base Forum. The Knowledge-Base Forum is not an alternative to Blackboard, Moodle or other learning management systems but designed as something that can complement current e-learning systems or as a standalone system providing help with content by contributing members.

The Knowledge-Base Forum allows content to be published and used as a repository for all content created. All registered users are allowed to bid and upload

content. By checking the content rating, students, researchers and academics would benefit from the knowledge. Students can benefit from extra reading material which is good for their overall learning however students are not allowed to contrite content.

Wish list item 14 presented its own problem; although academics would initiate the search, they would also have to read and verify the various links and documents. This would result in the same dilemma: academics spending their valuable time filtering lots of content, which would ultimately defeat the whole objective to save time and effort.

For this reason, as an alternative to searching for similar content, displaying and rating them, it is proposed that the forum will have rules allowing only credible persons to write content and thereafter being rated by academics and stored in the Knowledge–Base Forum; only the published content will be displayed in the searches. The credibility can be established by email identification if they are members of an academic institution. In this way, the content will be reliable, and academics will not need to filter and verify content, thus it should save academic's valuable time.

The prototype will be a request for content by academics, and credible members of the forum will provide the content. The initial submitter of the request will rate the article for the benefit of other academics that may need similar content. The article rating is based on the requester's requirement and how the requester feels the content matches their request. For example a rating of 5 is excellent article and rating of 1 is poor quality article. This modification solves the problem of filtering junk content, and more importantly giving control to academics needing content. Ultimately it will save academics time and effort.

In section 4.2.4 and 4.2.9, an FAQ and announcement section was requested for the benefit of students thereby saving academics time from answering the same questions, and making the same announcements. The FAQ and announcement section can be later provided by having a web page with common questions and answers. However at this early stage of prototype development and testing, the addition of these pages was not necessary, as the FAQ concept is common, popular

and not unique, therefore it can be added to later releases of the Knowledge-Base Forum solution.

5.4.2 How KBF will identify credible members

Rules can be set up within Knowledge-Base Forum that membership is conditional to recommendations from two professionals. Another way for interested members that work for educational institutions or a professional organisation can be identified by email during the registration process. This allows filtering of the trusted users. The Knowledge-Base administrator would verify membership requirements and approve members. However at this stage of prototype development writing the membership requirements detail is not required as this can be easily done in later releases.

When academics request content, those willing to provide the content (the 'bidders') will write a proposal detailing their experience and listing their publications. This allows another level of filtering to establish credibility before any bidders are awarded the job.

5.4.3 Training on Knowledge-Base Forum

As with all software a certain amount of training and learning is necessary. The Knowledge-Base Forum prototype is simple to use, none the less it will require few minutes of academic time to understand how the system works by online recorded video tutorial and a simple step by step guide.

5.4.4 Operational steps in using KBF

The application is focused to serve academic needs. It allows academics to submit requests for articles, contents or open a topic so a wide range of users can submit content according to the academics' requirement. Once a topic or a request for content has been posted by an academic, users can see the request and can bid to write content for that particular request. The academic chooses which proposal he/she likes and accepts the bid for the preferred content writer. The content writer compiles the content and uploads in the relevant section.

The academic reviews the article/content, is able to comment on it, rate it (for example, 5 stars is excellent and 1 star is poor) and has the ability to make it live so everyone can see the article/content. The academic can refuse and reject the content if it does not meet the original requirement.

Key points:

1. Requesting member creates a topic asking for bids to provide content
2. Members who are interested in writing content can bid
3. The requesting member chooses the winning bid
4. The successful bidder writes content
5. The updates are reviewed and rated by requesting member and approved prior to going live

The prototype framework has four core parts:

1. Topic owner, member who is requesting content

Any members can request content by submitting a topic name, description of the content that is desired and type of contributors the requesting user is seeking, for example, a subject specialist and experience in the relevant field. These requests are kept open for bidders to write content of the specified topic, the time limit for a bid to remain open, and the bid submission is determined by the member requesting the content.

2. Bidders

Member bidders are those who wish to write content on open topics. Every member has the right to submit a topic, requesting content. Bidders click on a bid button and request the topic owner for permission to write on the opened topic. They will need to write a brief description of the idea on the topic, i.e. how they can contribute to make the opened topic better with their knowledge, skills and research. Bidders will need to provide relevant evidence such as published literature, acknowledgement of being

an expert in a particular field by peers, references or professional standing to support the submitted information.

There is no condition in Knowledge-Base Forum that a contributing bidder has to have the favour returned by the academic who requested content. There is no financial motive for contributing as a Knowledge-Base Forum community member rather it is voluntarily. The Knowledge-Base Forum concept is based on the assumption that members would want to expand their knowledge, their peer's knowledge and their reputation. When becoming a member of the forum, they understand that they have a duty to write content where they have the knowledge base, and time allows. The academic world is underpinned by academics submitting articles for no monetary gain; a concept also employed by the Knowledge-Base Forum. The incentives to members are the same as those when submitting a journal article; sharing their knowledge, increasing the readership of their research and thus developing their institutions reputation for research. This point is further elaborated in section 5.7.

3. Articles

The content is created by bidders who are members of the forum and have permission to write content in response to requests posted by a requesting member.

This is first submitted to the respective requesting member. Once the requesting member approves, the content is published on the forum and becomes available to all members.

Each time bidders submit their content, they await the topic owners' feedback. The topic owner provides feedback and has the final say on the articles submitted by the bidder. The feedback will consist of a text field directly below the written content. The bidder improves the quality of the article based on the feedback received by the member topic owner, and submits a new version of the content. Each improvement will have updated versions listed with respect to the time and date they are submitted.

4. Comments and reviews

Members of Knowledge-Base Forum can submit their comments on each content article. Comments are first reviewed by the owning member prior to publishing.

Key points:

a) Only two type of members: a requesting member who is opening content and a member bidder who will bid to write content for the requesting member.

b) Bidder submits bids on the opened topics to provide content

c) Requesting member reviews the bidders' profile and chooses to allocate to the appropriate bidder.

d) Bidders get the status as awarded bidder, where they are authorised to write content on the topic.

e) Content will only go live, once the requesting member approves it.

f) Only the requesting member can submit ratings on the content.

g) Like – button can be clicked by members if they like the content and topic.

h) Comments will be published once they are approved by the requesting member.

i) Only the requesting member who posted the topic has the right to approve other members' comments, rate, or add their own comments.

5.5 Navigation of Knowledge-Base Forum prototype

This section is a walkthrough of the Knowledge-Base Forum system. The walkthrough consists of screenshots and describes the navigation of the Knowledge-Base Forum, from submitting content request to bidders bidding, awarding and job complete, and finally searching the publications. The prototype documentation on the configuration can be found in Appendix 11 along with screenshots.

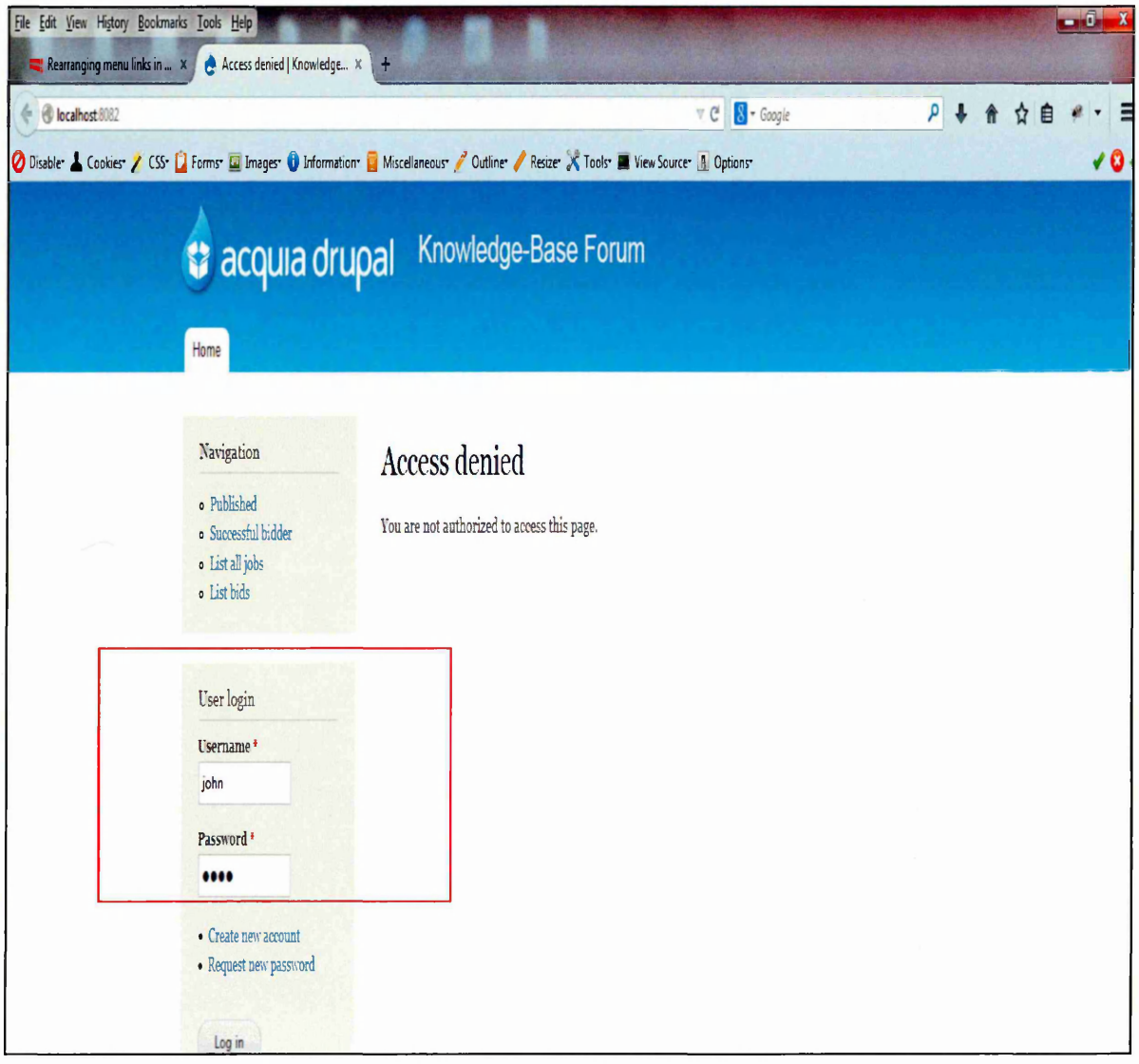
Walkthrough scenario: an academic requires a written document relating to Java programming language summarised in 1000 words. The academic in this scenario

has difficulty finding this information, therefore uses the Knowledge-Base Forum to request help from an expert.

The first step is to log into the Knowledge-Base Forum. Figure 5.1 shows the login screen to enter the system.

Step 1 – Login

Figure 5.1: Example of the login screen

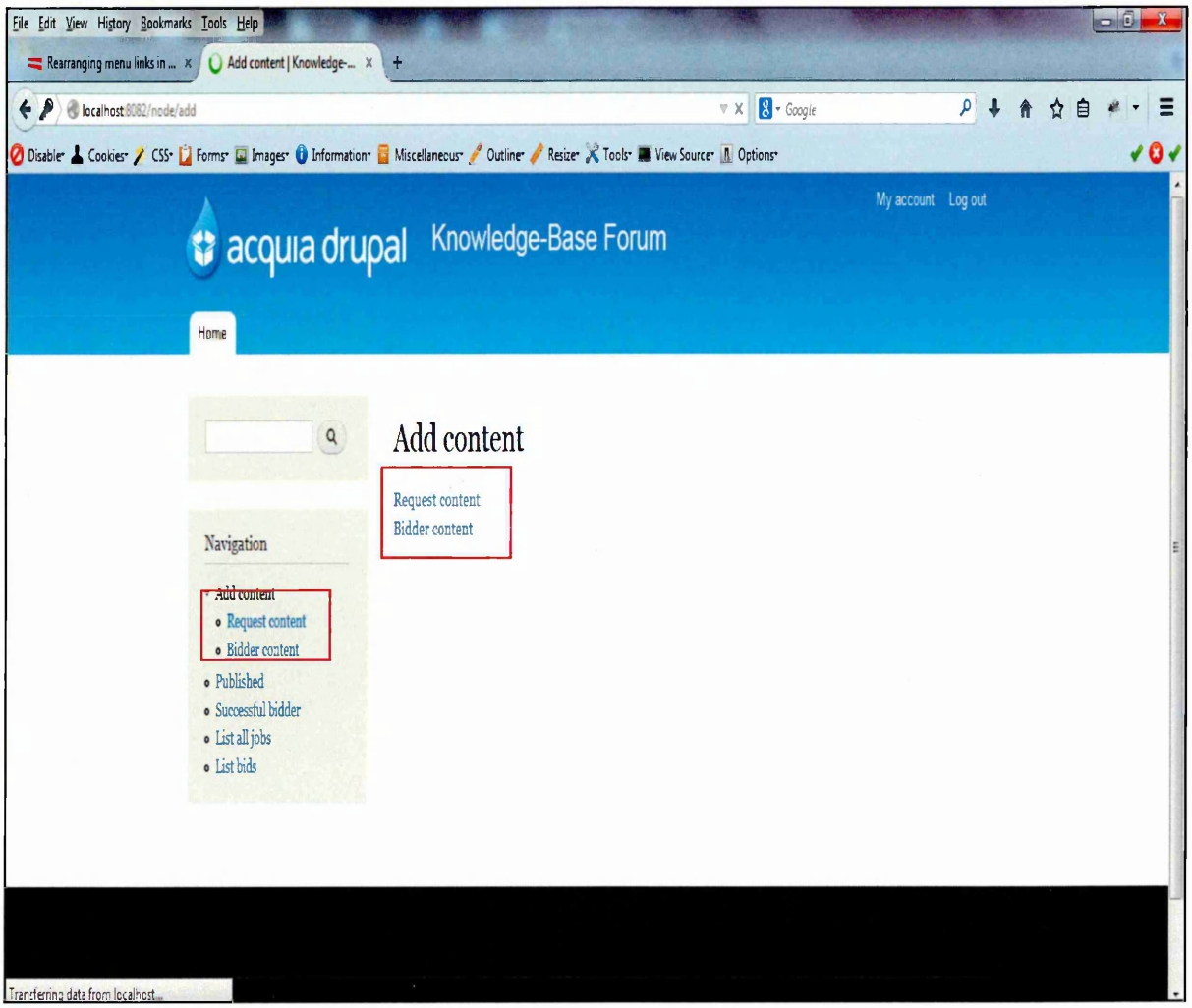


Step 2 – Request content

After logging into the system, the user will gain access to the Knowledge-Base Forum homepage. Two options are available - 'Request Content' and 'Bidder Content'. The home screen is simple and doesn't use jargon except when necessary.

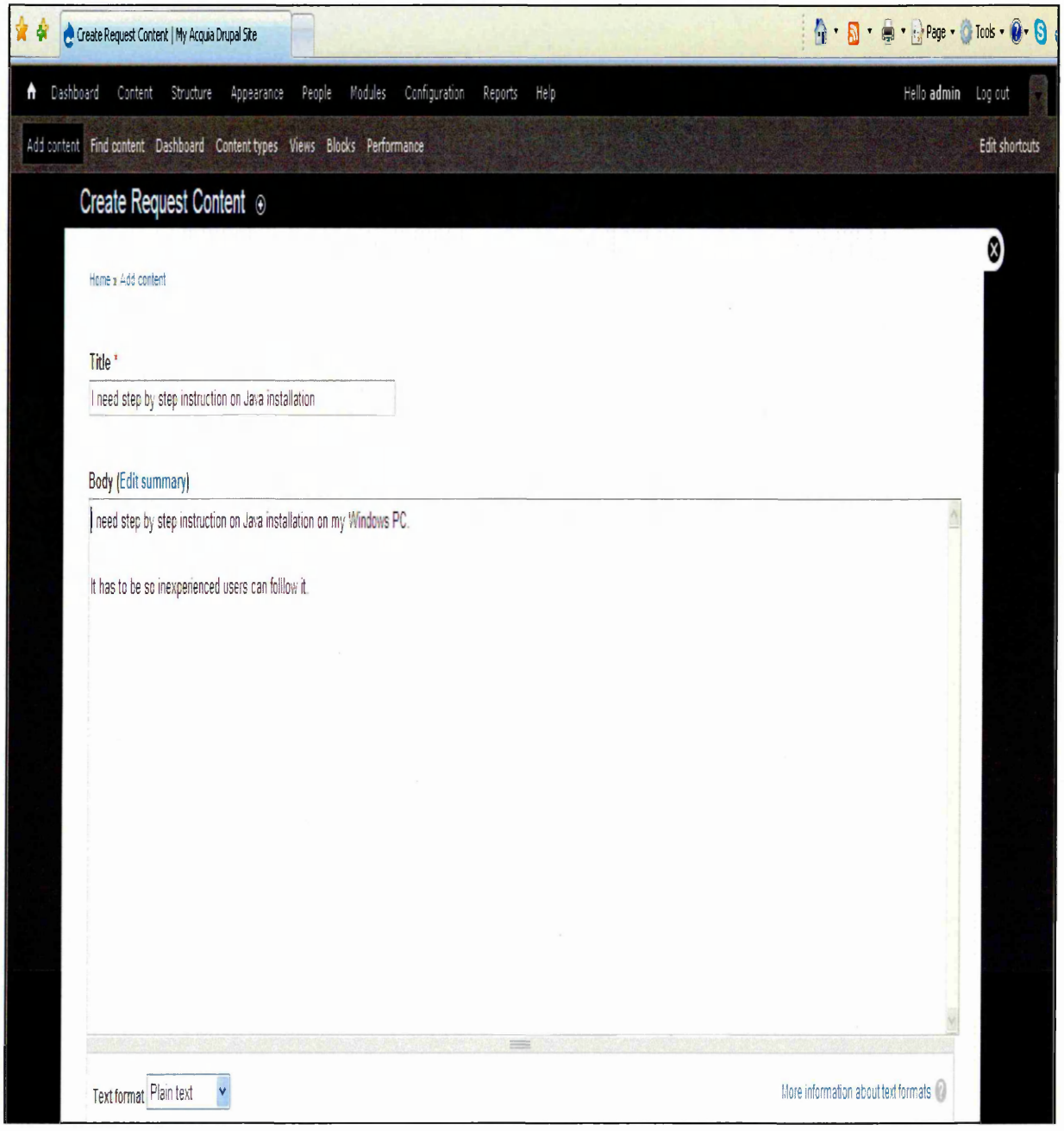
Figure 5.2 shows the home screen and the options available. If the academic wants to request content, they will need to click on 'Request Content', or if they have previously submitted a content request and they are working with a bidder on a project, they will need to click on 'Bidder Content' to view the job progress.

Figure 5.2: Example of the home page, academic chooses to request content by clicking 'Request Content' or see progress of a project by clicking 'Bidder Content'



When the academic clicks on 'Request content', the 'Create Request Content' page opens, to specify the content academics are seeking from community members.

Figure 5.3: Example of the 'Request Content Page', showing detail the academic needs to insert for requesting content.



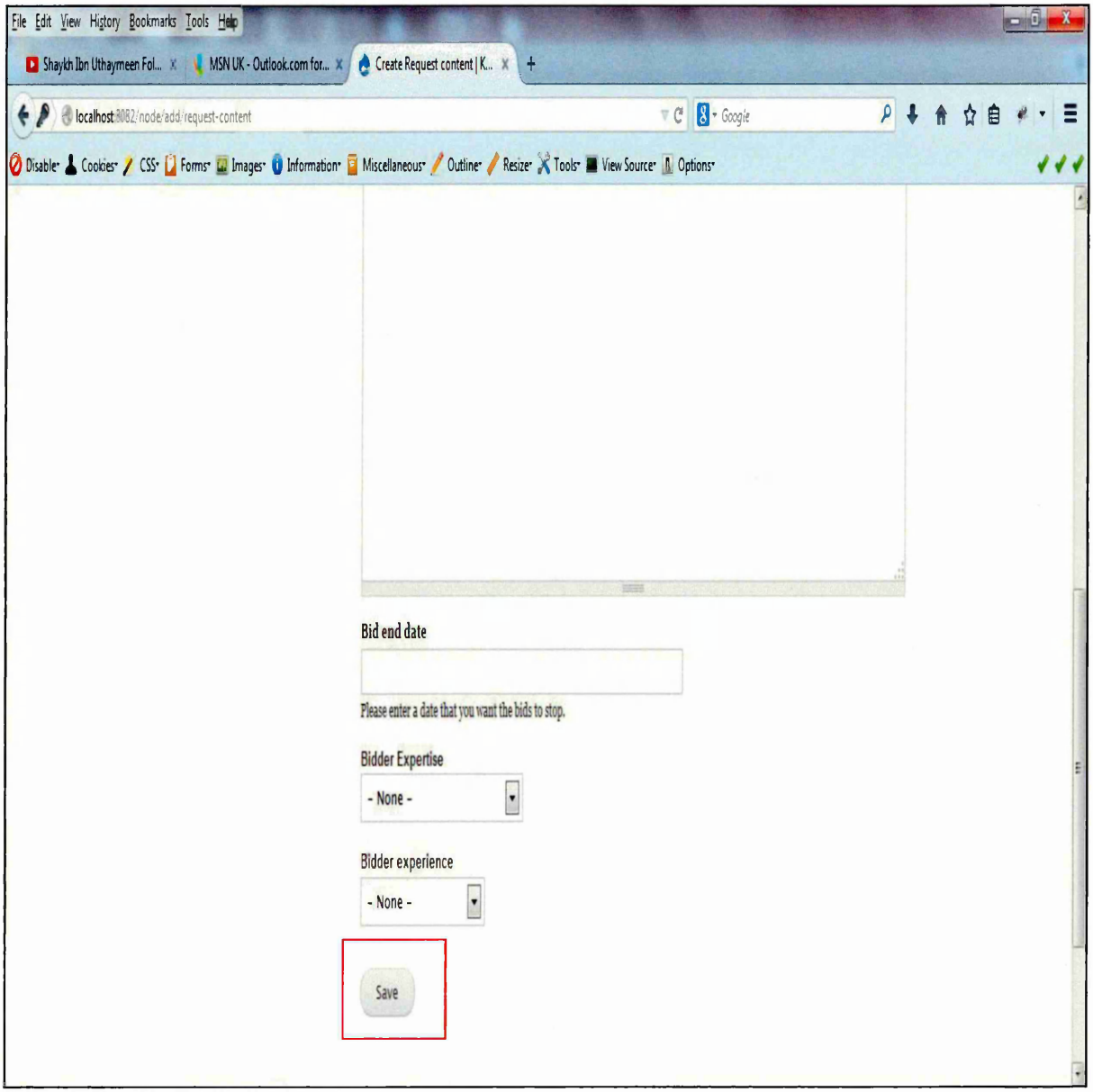
The academic needs to complete the details on 'Create Request Content' as Figure 5.3 shows. This information is necessary for the bidder to understand the request. Table 5.3 shows the information required from the academic.

Table 5.3: Showing the information required when academic request content

Title	Title of the topic
Body – Summary	Summary and description of the content required.
Bid end date	End date for the bidders to bid
Bidder Expertise	Content writers expertise, the bidder can select from a list of options: Technology Law Geography Engineering Health and Natural sciences Arts and Literature
Bidder Experience	The academic specifies how many publications the bidder should have as a prerequisite to bid, a list of options is available to the academic to select from: ☐ None ☐ 0 - 4 Publications ☐ 5 - 10 Publications ☐ 11 - 15 Publications

Once the information has been completed, figure 5.4 demonstrates how the request is submitted.

Figure 5.4: Example of saving the content request to start the bidding process



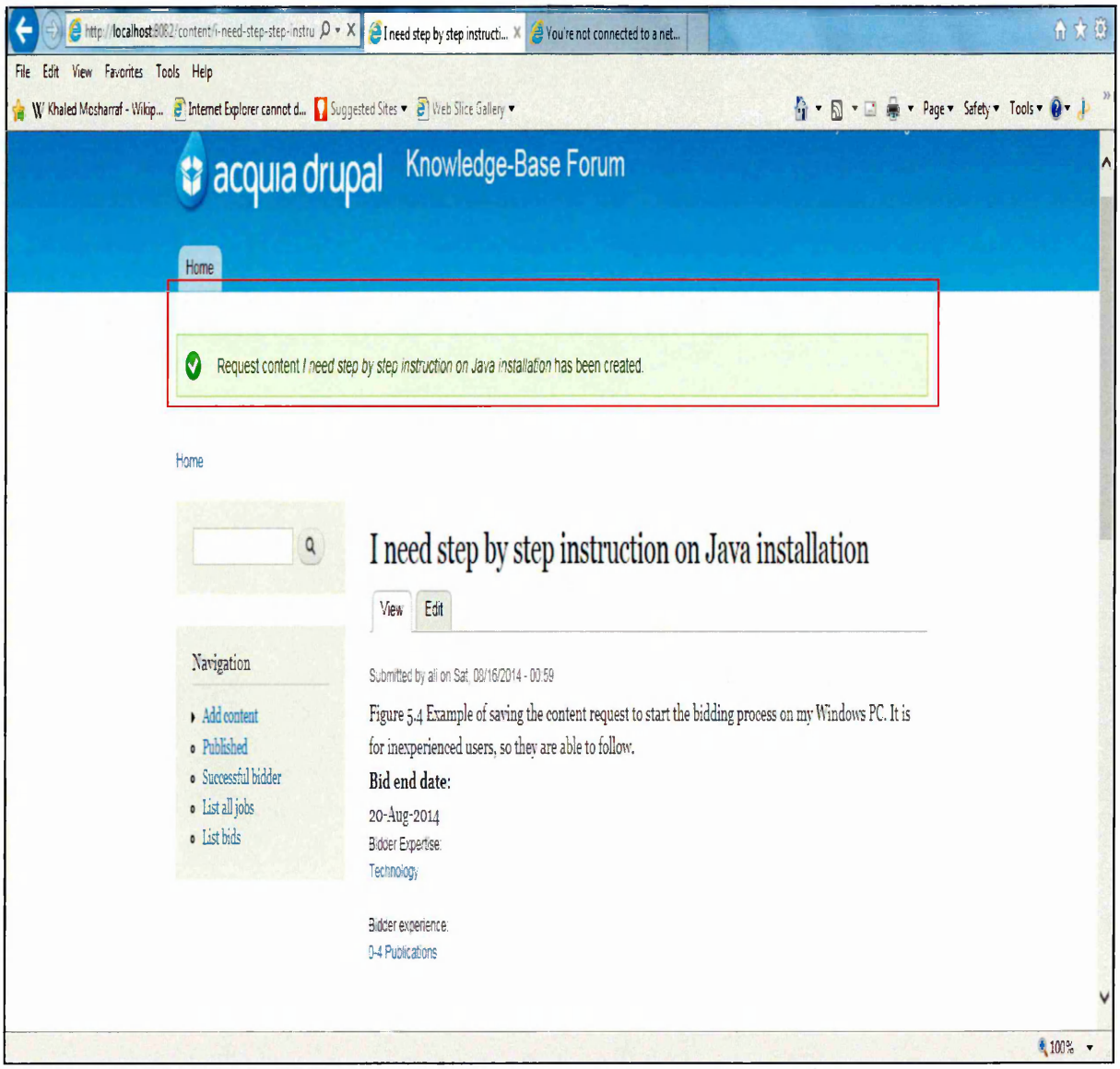
Once the academic is happy with the title and description of the content they are seeking, the 'Save' button is clicked to save and open the bidding process.

Step 3

Once the 'Save' button is clicked, this request is submitted and the Knowledge-Base Forum will display the request as confirmed.

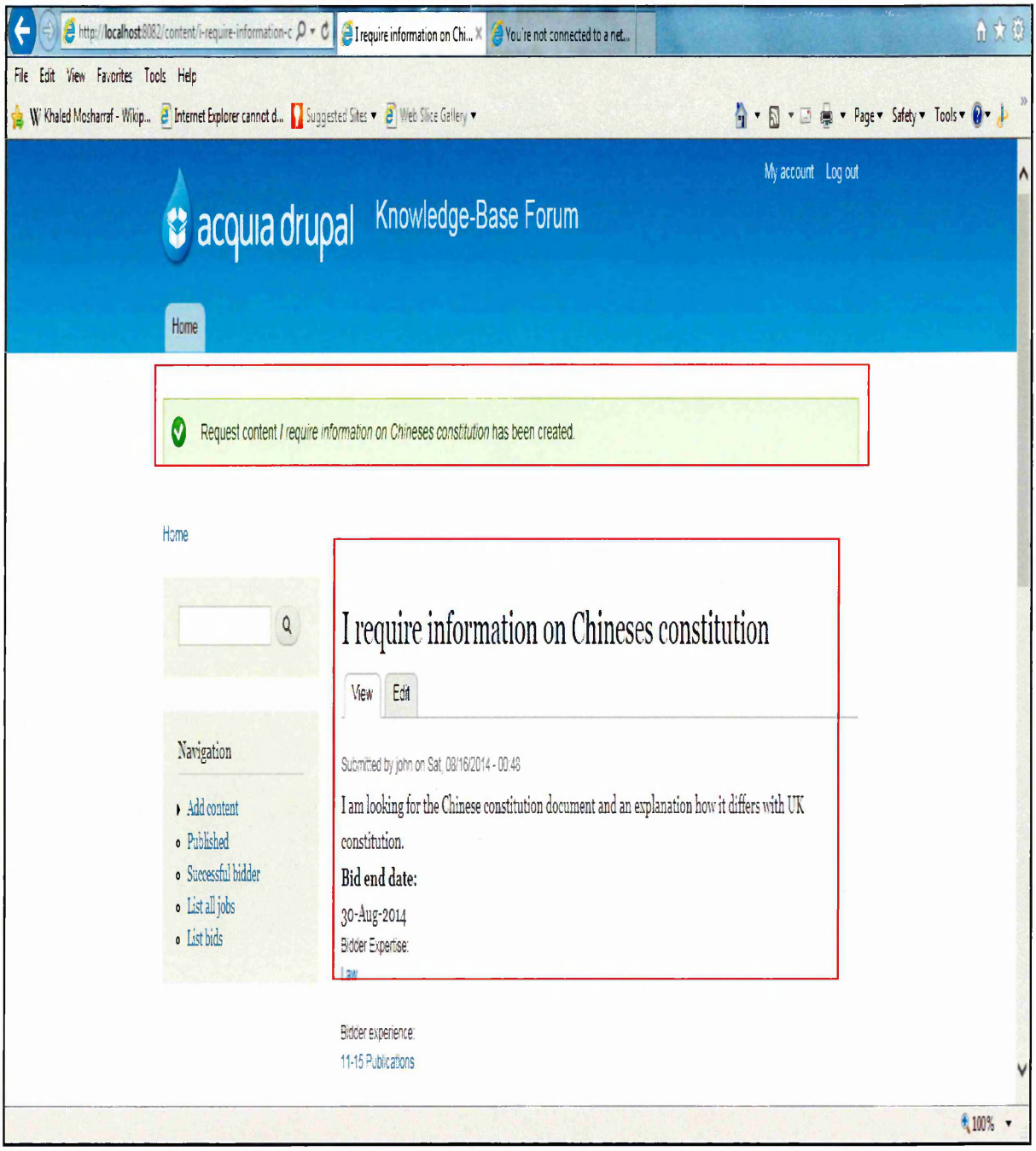
Figure 5.5 shows an example of the confirmation screen. This example shows content that is requested for Java installation instruction for a Windows operating system. It states the bid end date, the subject expertise the bidder should have and experience in terms of number of publications of the required bidder.

Figure 5.5: Shows an example of confirmation screen when request for content is submitted.



Another example is shown below in figure 5.6 of a content request made on Chinese Law. This example shows content that is requested for the Chinese constitution. It states the bid end date, the subject expertise the bidder should have and level of experience the bidder should have.

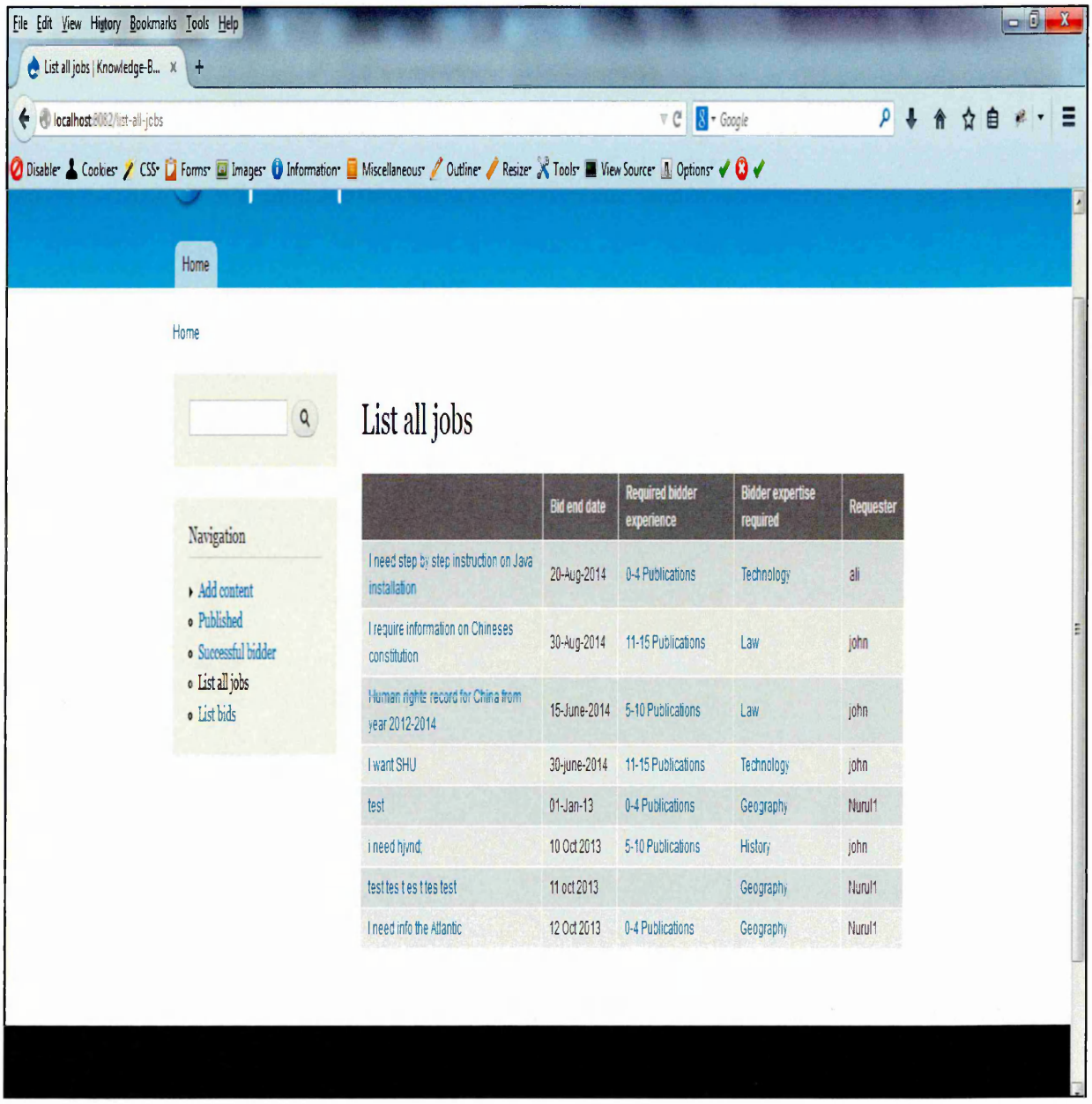
Figure 5.6: A second example of request for content.



Step 4 - Bidder views academic requests for content

The bidder logs on to the Knowledge-Base Forum as shown in Figure 5.1 and clicks on the 'List all Jobs' option in the Navigation menu.

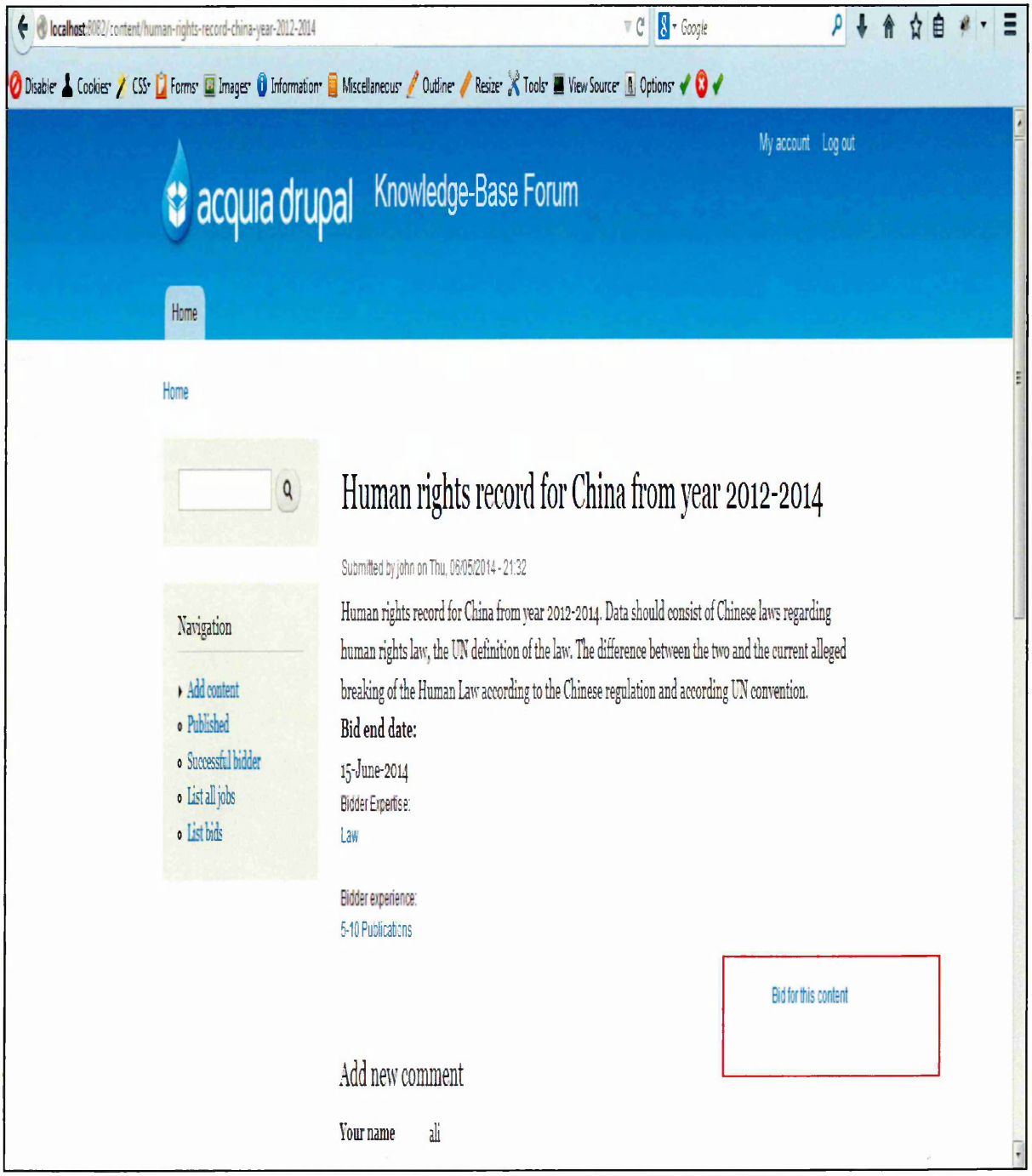
Figure 5. 7: Example of bidder reviewing all requests made by academics.



The bidder will see the entire request in the list of jobs and can click on a job for more detail.

The detail page opens up detail of the request. The bidder can bid for a job by clicking on 'Bid for this content'.

Figure 5. 8: Example bidder reviewing request and activate the 'bid'.

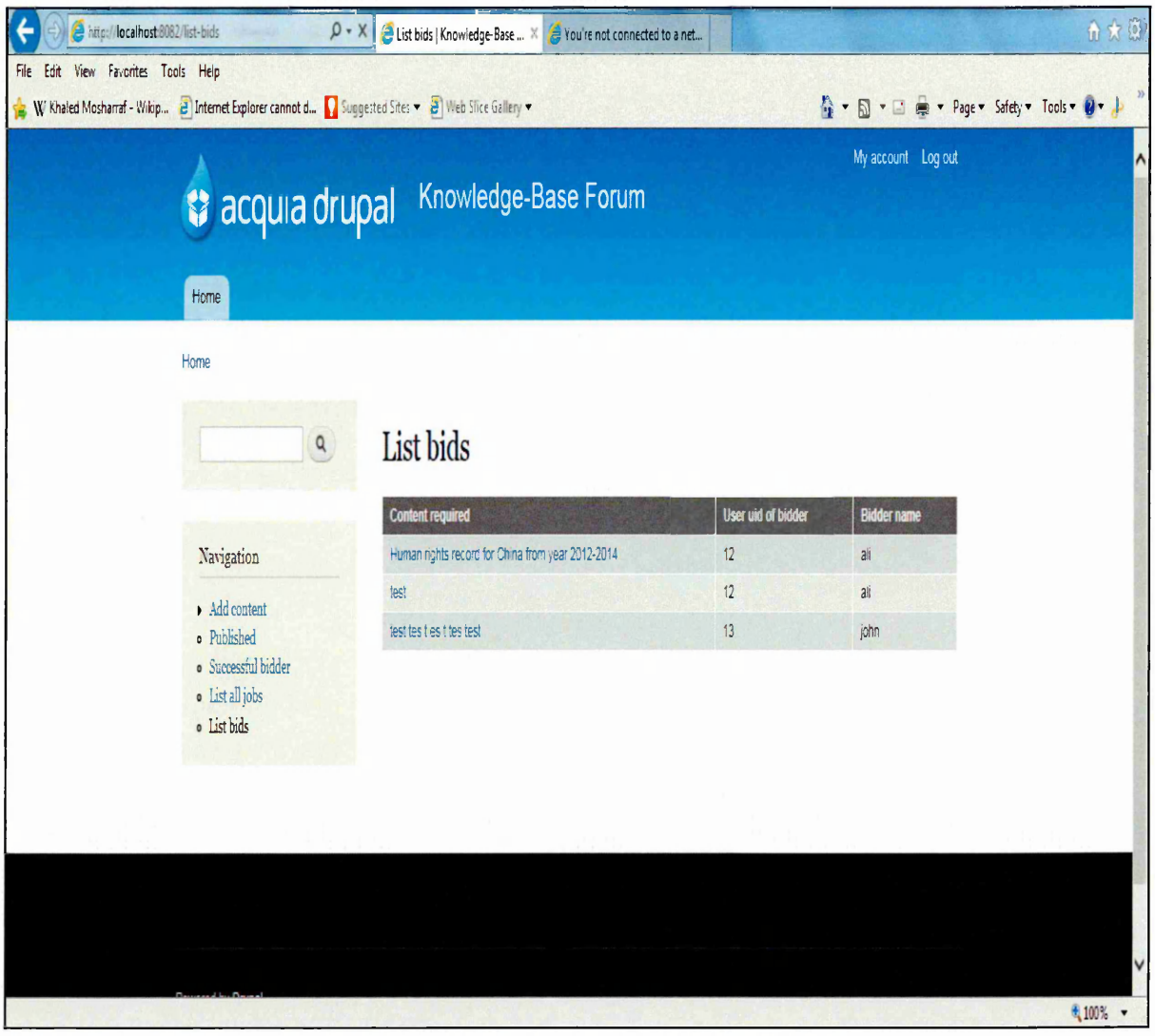


Step 5 - Academic awards bid

The academic who requested content will be able to view all the bids made by bidders.

The requester can view a table of bids on the content requested and is able to find out further detail on the bid.

Figure 5.9: Academic clicks on 'List of bids' to displays all bids.

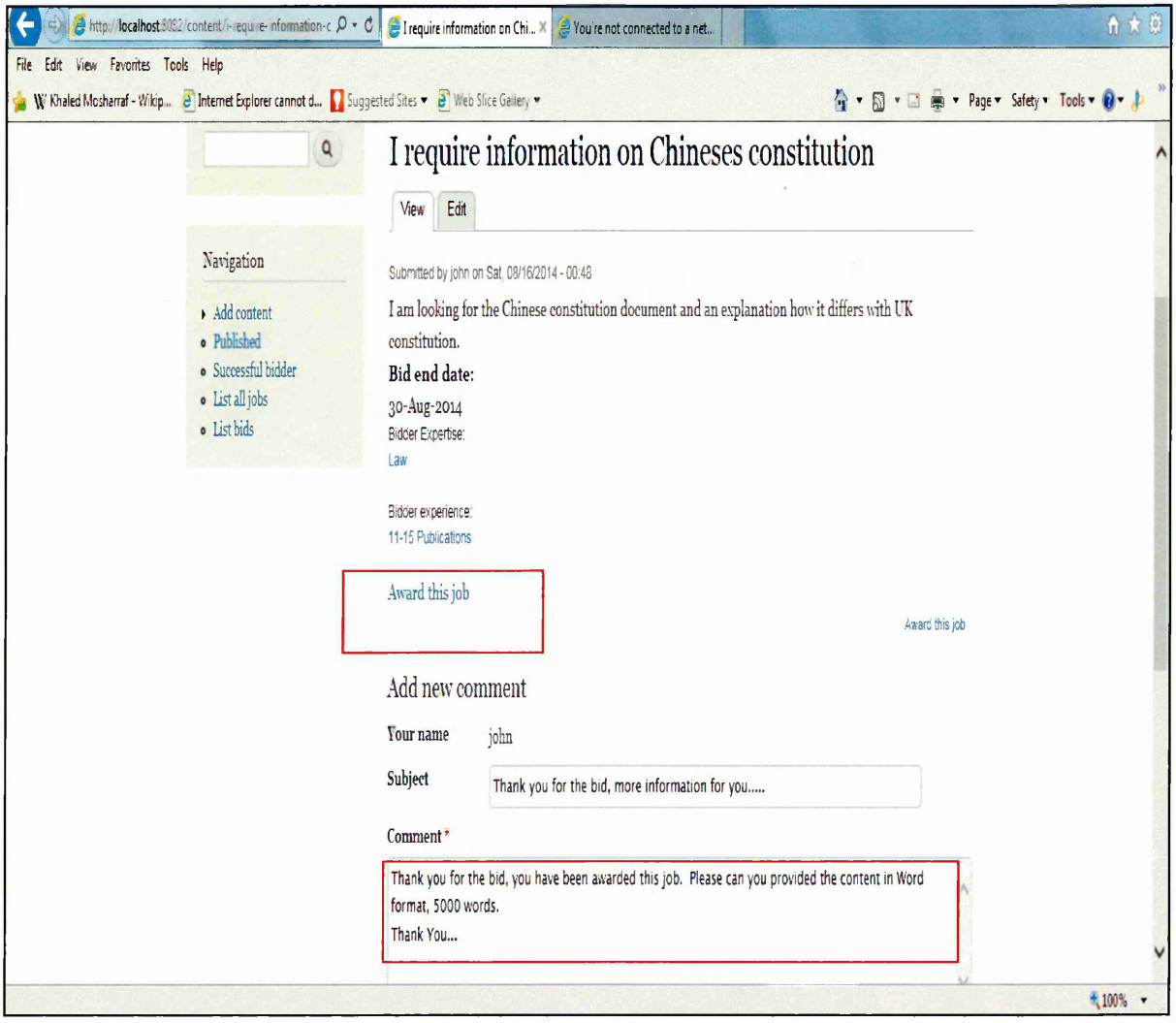


The academic clicks on the 'List of bids' which displays all the bids, then the bid can be clicked which provides more detail of the content as shown below in Figure10.

Step 6 - To award the bid

The academic requester can award the job to any bidder by clicking the 'Award this job' button. The academic may choose to make a comment and request more information from the bidder, or simply award the job to bidder.

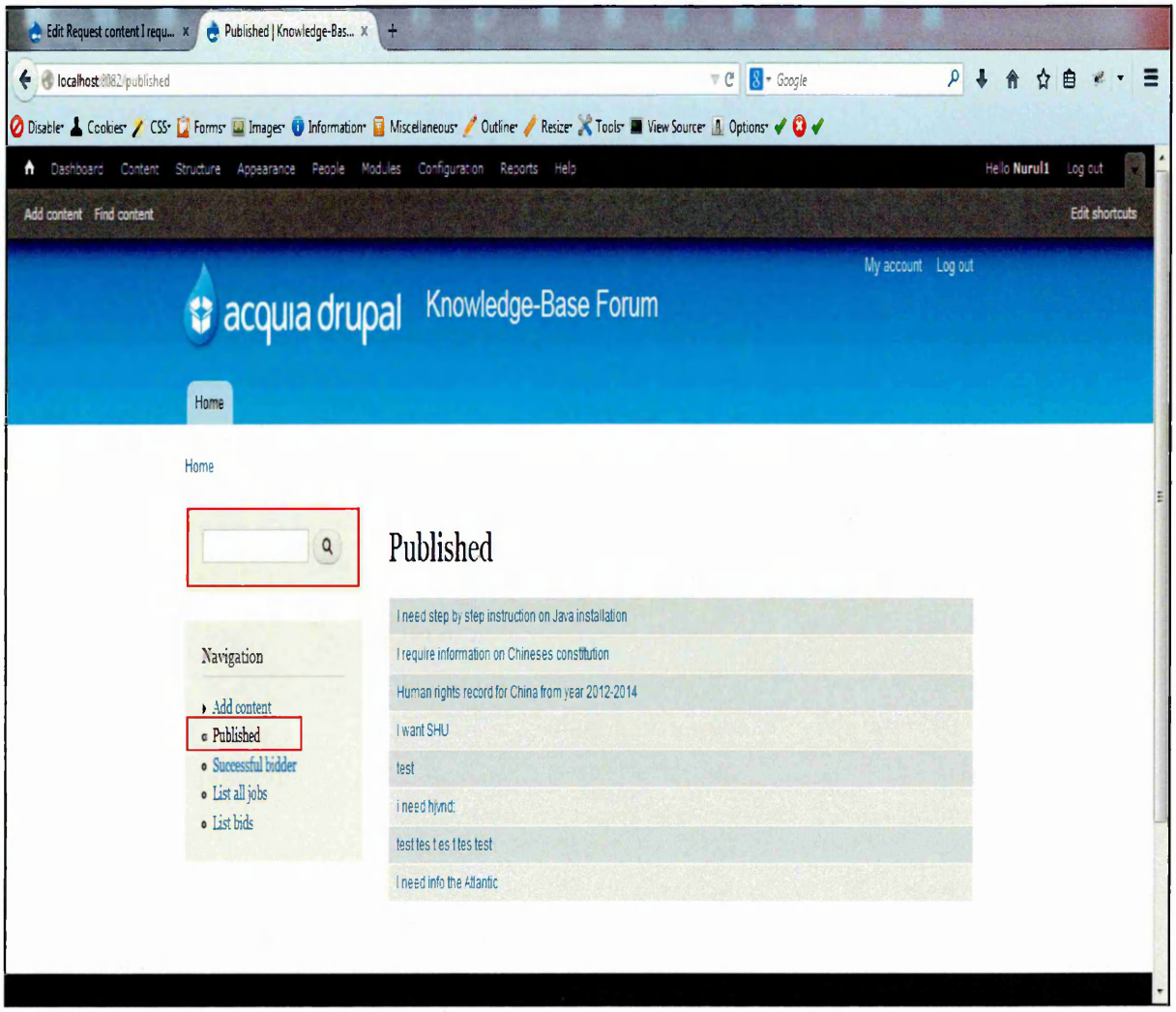
Figure 5.10: Example of the requester reviewing the bid and awarding the bid by clicking on 'Award this Job'.



The Figure 5.10 also shows that the academic requester is able put a message with the award. The above example shows the academic requester giving further instruction of content length and the format required when the job is complete.

Step 7 - Publish document

Figure 5.11: Example of the requester reviewing the published document by clicking on published button on home page.



In Figure 5.11, the search box allows members to search for articles within the Knowledge-Base Forum.

To summarise, if the academic requires content, they will submit a request. Bidders respond to this request by submitting their bid to the academic. The academic then approves their chosen bidder. Once the bidder has completed the task, the job is assigned to the academic for a review. The academic reviews the content and if it is correct the academic publishes the content, but if the content is not up to standard, the job is rejected or a request for amendment is made. The review process continues until the academic is satisfied with the material.

5.6 Results and analysis of the trial of the prototype

A prototype has been developed according to the framework described in section 5.4.1 and 5.4.2. Four academics were approached to trial the prototype; they were given access to the Knowledge-Base Forum for 5 days to enable them to use the system. After this trial period, interviews were conducted with each of the academics to find out if the prototype could help academics in their role by reducing time spent on e-learning applications. Academics could test the functionality of requesting content, the bidding process and awarding the job to a winning bidder but since no content contributors existed therefore having actual teaching material or content creation was not possible.

To achieve the response of a bidder and the bidding process a dummy user account was created to fulfil the functionality of content contributors and dummy content was provided to show the academics how Knowledge-Base Forum could work in real life environments as long as there were sufficient contributing members.

After the trial the following four questions were asked:

1. Does the forum help in reducing time spent on e-learning tasks?
2. Is it easy to use?
3. Do you find it useful for communication purposes?
4. Would you recommend it to your friends, colleagues, other academics or associates?

The post-prototype interviews transcription can be found in Appendix 9.

Out of the four academics only three academics piloted the prototype.

One academic did not participate in the trial of the prototype as he did not find the application beneficial, his argument is discussed in section 5.7.

Table 5.4 below shows the analysis of the academics' interviews, and their behaviour during the demonstration of the prototype. They demonstrated interest in the application, described it as simple to use and overall showed enthusiasm for the prototype.

Table 5.4 Interview analysis of Dr AK after piloting the prototype

Dr AK	Points observed from academic
Does the academic like the Knowledge-Base Forum?	Smiling with enthusiasm. Appears to like the system.
Does Knowledge-Base Forum appear to be useful for the academic?	Academic keen to use software and appears he like the idea and suggests other things that can be added to system to make it better such as function for networking like LinkedIn. His statement: *"It is obvious to me, I think its brilliant having to think of wanting a piece of information and then clicking it goes to another person"*
Does it appear easy for the academic to use?	He seemed to find it simple as he figured the functions with little training or guidance, *he said: "quite easy (to use)".*
Does the academic appear stressed or annoyed at any point using Knowledge-Base Forum?	No sign of stress or annoyance at all.
Immediate analysis after interview: Dr AK was very keen, positive and interested using Knowledge-Base Forum. He thought it would help academics and could see many benefits from the system.	

Table 5.5 Interview analysis of Dr UH after piloting the prototype

Dr UH	Points observed from academic
Does the academic like the Knowledge-Base Forum?	In the first 5 minutes his facial expression was puzzled and did not understand the purpose behind the system. However once he understood it could be used to request content he liked the system and liked being in control of requesting content unlike search engines where he would search through unnecessary information. He said: *"If it is fast then it will save time"* *"It reminds me of usenet, a portal where you can go and seek assistance and join groups"*
Does Knowledge-Base Forum appear to be useful for the academic?	He smiled many times as though he was familiar with the concept and showed interest in exploring what the application is capable of. He quickly went on to show Usenet and Newsgroups, as an example of a similar concept. However, he could not find it by searching Google as the format had changed and was text based without any GUI. He said he liked the Knowledge-Base Forum GUI and layout over Usenet. He said: *"Yes why not, if it helps me when I need answers then it is natural to discuss with your colleagues"*
Does it appear easy for the academic to use?	He found it extremely simple to use. He said: *"It is very basic and simple"*
Does the academic appear stressed or annoyed at any point using Knowledge-Base Forum?	He was relaxed, familiar with concept and technology
Immediate analysis after interview: He liked the idea of Knowledge-Base Forum. He could see it being successful, providing it is set in a credible environment such as institutions where credibility is valued, and as long as time wasters don't use it.	

Table 5.6 Interview analysis of Dr D BB after piloting the prototype

Dr .BB	Points observed from academic
Does the academic like the Knowledge-Base Forum?	Smiling, nodding in positive manner and appeared to like Knowledge-Base Forum. He said: *"It saves you time from writing the content."* *"You get to an expert and you know it won't waste your time".*
Does Knowledge-Base Forum appear to be useful for the academic?	Positive from his body movement and liked the functionality of requesting content. He said: *"Oh definitely yeah. You are preparing to communicate your needs in that way"*
Does it appear easy for the academic to use?	It appeared easy for him. He said it involved only a small number of steps. He said: *"Absolutely, yeah. Definitely because if I could use it ... I will ask my colleagues too"*
Does the academic appear stressed or annoyed at any point using Knowledge-Base Forum?	No annoyance at all. No sign of being lost or confused rather smiling and engaged
Immediate analysis after interview: He was interested and keen. He made me feel like I invented something new which will benefit the academics and that the application will be a success. Dr BB is someone who is very cautious of technology and finds IT a challenge but Knowledge-Base Forum was easy for him to use and understand. He showed no sign of being lost or confused. Instead he was engaged and was suggesting ways it can solve some problems he experienced and excited to see it working in a live environment. He was curious of the level of participation required to make it a success in a working environment.	

Table 5.7 Interview analysis of Dr AD after piloting the prototype

Dr .AD – ***NOT PILOTED*** ***Discussed in section 5.7 in more detail***		
Do they appear to like the Forum submission?		***NOT PILOTED***, did not want to look at the application because it is not useful or beneficial to academics. Academic stated plenty of these applications exist such as Google scholar and other search engines that do this job well enough. Dr. AD's points are discussed and addressed in section 5.7.
Does it appear the forum is useful for them?		
Does it appear easy for them to use?		
Do they appear annoyed at any point?		

5.6.1 Key findings after trial: Knowledge-Base Forum saves time

Three out of the four academics said this application would help save time, one academics did not trial the application.

Statement academics made:

"It saves time and cost because once you send it and another colleague actually responds. Not just giving you the answer but also making you aware of specific places you can go for that information. So sometimes it's not just giving you the content but giving you ideas about where to find the information which will certainly reduce the cost or the time" (Dr AK Interview, Appendix 9)

"If it is fast then it will save time" (Dr UH Interview, Appendix 9)

"It saves you time from writing the content" (Dr BB Interview, Appendix 9)

The common disadvantage stated by academics in my first interview sessions was the time factor - increased works hours due to e-learning systems. Most academics, three out of four of those who piloted his study, liked the idea of putting questions directly to a pool of experts, where they are in control, and they decided what content they require.

The academics made some suggestion in order for this system to work effectively. They suggested the system has to be designed so the response is timely and fast. Secondly, and most importantly, they pointed out that the contributing users of the system must be credible to build trust, so it should be based within an academic environment.

5.6.2 Knowledge-Base Forum can reduce workload

An academic stated time was spent on preparation for materials *"I think that we are made to do more for ourselves now"* (Dr F Interview, Appendix 4). By using Knowledge-Base Forum academics would benefit by saving time and workload.

After the trial of the prototype three academics stated that Knowledge Base forum can help with workload. The contribution will be made be by members of Knowledge-Base Forum by going through the bidding process. The following quotes from academics support that the Knowledge base forum can help with reduction in workload:

"It saves time and cost". The system will either allow the content to be produced or helpful hints that will save effort, time and cost (Dr AK Interview, Appendix 9).

I was looking for information on the differences on Chinese and British Law, you get huge documents but this is not what I am looking for, "I need snippets of information" (Dr BB Interview, Appendix 9).

"(Knowledge-Base Forum is) A portal where you can go and seek assistance" and his statement "if it helps me when I need answers" (Dr UH Interview, Appendix 9).

Knowledge-Base Forum can be utilised as a platform for networking with academics, which can help with reduction in workload:

"I can see that network in the sense that when people require to get free information and they think you have the expertise or you belong to that, you can easily and we do that" (Dr AK Interview, Appendix 9).

"I think its brilliant having to think of wanting a piece of academic information and then clicking it goes to another person and…its certainly… that is if it works well (Dr AK Interview, Appendix 9).

By reducing hours spent on writing materials academics can concentrate on their teaching role. It will also help academics in times of busy periods such as beginning of semesters and during the assessment period.

"Obviously it's going to save time and even cost. It saves time and cost because once you send it and another colleague actually responds" (Dr AK Interview, Appendix 9).

"It saves you time from writing the content." (Dr BB Interview, Appendix 9).

"Not just giving you the answer but also making you aware of specific places you can go for that information. So sometimes it's not just giving you the content but giving you ideas about where to find the information which will certainly reduce the cost or the time" (Dr AK Interview, Appendix 9).

Knowledge-Base Forum will provide a service of experts that academics will benefit from:

"Several people can give you information so that...not just from that person. You look at getting a wide range of information about." (Dr AK Interview, Appendix 9).

Academics will be in control of what content they want, rather than searching for snips of information from various places to produce the final content. In Knowledge-Base Forum, academics state exactly what they want and a contributor will satisfy the request.

"I need a snippet of information you know. Oh definitely yeah. You are preparing to communicate your needs." (Dr AK Interview, Appendix 9).

Knowledge-Base Forum will hold a repository of all contributions that can be accessed.

"Certainly beneficial (repository)" (Dr AK Interview, Appendix 9).

The transaction logs collected does not provide precise detail on how long an academic spends on material creation. However the quantitative data in table 4.5 and table 4.6 shows an academic spending 21 hours and five academics spending 6 to 10 hours a week, a significant time spent on the Blackboard system. This supports the qualitative interview data that academic do spend long hours using e-learning systems and the clear comments from academics that Knowledge-Base Forum would reduce workload and save time.

5.6.3 Knowledge-Base Forum is easy to use

All three academics that trialled the application said it is easy to use. *"It is very basic and simple" (to use),* (Dr AK Interview, Appendix 9).

"Definitely, because if I could use it" this means it is easy to use" (Dr BB Interview, Appendix 9).

"It is very basic and simple" (Dr UH Interview, Appendix 9).

The complexity of current e-learning applications academics use in their respective institutions puts pressure on staff and this can create health issues. Although the majority of academics had some training, there were concerns that the e-learning system was too complex and that enhanced training would be required according to the analysis of the first interviews. The prototype application was designed having this goal in mind: being easy to use, with minimal training required, that would mean less stress and annoyance to users.

5.6.4 Knowledge-Base Forum is useful for communication purposes

Three academics stated that Knowledge-Base Forum can be a useful communication tool. An academic pointed out that if it allowed the invitation of colleagues to participate as other social networking applications do, then it would be of assistance to lecturers, enhance communication and allow the number of users to grow.

"Oh definitely yeah. You are preparing to communicate your needs in that way" (Dr BB Interview, Appendix 9).

So with this particular network (Knowledge-Base Forum members)… I can in the sense that when people require to get free information and they think you have the expertise or you belong to that, you can (communicate your ideas) easily and we (will) do that" (Dr AK Interview, Appendix 9).

The prototype application is designed so that communication is directed to experts, this enhances academic communication. No doubt this will aid in saving time, effort and productivity. If there were positive results from this question, then it shows a positive outcome of the application.

5.6.5 Academics will recommend Knowledge-Base Forum to their friends and colleagues

Academics liked the prototype and would want to see the finished product live. Three academics stated if Knowledge-Base Forum performs well in a real working scenario then they would recommend it to their colleagues. Any further approval from them would have to be based on the real application, after being used in a working environment and contributed to by multiple users.

"Yes, why not, if it helps me when I need answers then it is natural to discuss with your colleagues" (Dr UH Interview, Appendix 9).

"Absolutely, yeah. Definitely because if I could use it ... I will ask my colleagues too" (Dr BB Interview, Appendix 9).

5.7 Discussion

The fourth academic Dr. AA, listed in Table 5.7, did not like the application, and did not want to trial the prototype by stating it was not something he would find useful. He believes academics don't share data or content for free. Publishers may write content but definitely not academics. Since no convincing incentives were presented to him for academics to share data, he doubts anyone would use it.

Dr. Adams also stated *"lot of information is freely available so no need for content from other academics"*. He also stated *"Google Scholar provides similar service"* (Dr AD Interview, Appendix 9). In Google Scholar an advance search can be conducted adding extra phrases, authors, dates, geographic locations and the content is immediately sourced. Dr AA could not see how Knowledge-Base Forum would contribute to academics' role in aiding teaching. He has access to similar communication tools, which are sufficient for communication purposes. He is associated with network of colleagues through professional bodies and institution liaisons, therefore this Knowledge-Base Forum would not help him. To counteract Dr AA's arguments it can be stated not every academic has a large network of

colleagues and associations. For example, new academics that may not have similar level of professional contacts can benefit from Knowledge-Base-Forum community.

Dr. AA has a valid point on incentives; however the same argument applies when academics are publishing journal papers. What are their incentives for doing so? The same incentive academics find when publishing in journals can be applied in Knowledge-Base Forum. The content will have academics' details and credentials, it will be published and viewers will be able to read the content.

Knowledge-Base Forum is unique to publishing decision time by design. The decision to publish contributed article would be quick, as the person reviewing the work would be the academic that made the request and no other process of verification is required, in comparison to other journals and publications where multiple experts are involved for the peer review process. The contributors can check their article with a simple search. There are no charges or fees for contributing content that is published. Once the content is published the author retains copyright for their contributed content.

Dr AK who trialled the Knowledge-Base Forum made two interesting statements about differences in academic position to research and knowledge which puts Dr AA's statement points in perspective, he said:

"Anybody who speaks knowledge will certainly not under-rate anything"

"Every academic has a level… some people do not accomplish at all. They just limit themselves to their teaching and that's it. We have academics who teach as well as get involved in professional development activities and all that, very proactive. If you meet anyone of them you will certainly be excited about the responses they give to you."

Knowledge-Base Forum can be further developed to encourage professional bodies and network of associations to join the forum; this way the network gets bigger, which will benefit individual members as they network. Also it could be developed to the standards of Research Excellence Framework (REF) for assessing the quality of research in UK higher education institutions (HEIs). So institutions would encourage

the use of Knowledge-Base Forum, so that academics can use the application to prove the 'impact' of their work. Therefore, more might be convinced to use it.

Knowledge-Base Forum can have the same impact as Google Scholar if its community members, bidders and contributors grow. Having Knowledge-Base Forum repository would be a welcome for many scholars and students of knowledge according to.

Dr AA was adamant that in his experience he and his colleagues get content from publications, search engines or a network of colleagues they are associated with through professional bodies and institution liaisons. He says a lot of information is freely available, but the time consuming thing is to filter out the junk. This, he believes, is already done in Google Scholar where an individual can run advance searches by selecting author, date range, geographic locations and the job is complete. He cannot see how the prototype will add benefit to this process.

The argument here is the content is freely available in search engines, publications and professional bodies; it will still require academics to search through lot of materials to find the exact matches. The majority content through searches will not be useful, others may not be related, or the content is too long to read through quickly. An academic can make these searches but when correct data is not found what does the academic do? This is where Knowledge-Base Forum is highly desirable, having an application that allows academics to be in control of what they want, what length or how many words they want, the specific details they are looking for, and even specifying the type of persons ensures the content will be valuable to any academic.

However, Dr AA's stated he may see a use for Knowledge-Base Forum provided it had a better filtering system than those already available in the market. He believes that the search engine in Google Scholar was the best currently on the market.

An important point to note is that the Knowledge-Base Forum allows only the correct content that was requested by academics to be provided by contributors or authors. Filtering is mainly required when you have junk content or too much content to search through; the prototype application goes one step further and allows only the requested content to be provided.

The bidding process allows the requesting academic to review the bidders, their experience and their proposal in how they will meet the task set. The bidding process acts as the filtering process in Knowledge-Base Forum, however it relies on the requesting academic to review the content that is contributed by bidder and to confirm if the academics expectations are met. The academic than rates the content accordingly i.e. 1 star for poor or 5 star for excellent. In any system the commissioner of a job ultimately judges the completeness and fulfilment of the project; and this cannot be avoided as the academic requesting content has to verify that it meets the expectations set. If content does not meet the expectation then academic may not accept the content and refuse publication, this enables control and filtering.

Google or other search engines filter the content by search key words. The result of this search will produce hundreds of items matching semantics of the query with the index of content existing in the search engine database which may or may not be relevant to what academics want. The search functionality exists within Knowledge-Base Forum; it allows for a search query and displays the result. A better filtering system can be implemented in Knowledge-Base Forum, the parameter that specifies experience of the content provider is available. For example, a member is able to search by criteria that displays contributor content who have more than 5 or 10 publications. The better filtering system can be added to the next version of development and testing.

The control in terms of Knowledge-Base Forum means academics gaining content according to their specification and desire. Academics request content by specifying a subject, a description of the content, and demand content provider to meet a minimum level of qualification and experience. Academics can state the length and format of the content required and any other requirements the academic may have. This is to ensure the desired delivery is achieved by selecting appropriate content provider using the bidding process.

An argument can be made against the Knowledge-Base Forum that requesting content, dealing with bids and grading content will take time this defeats the saving time objective. But this depends on the content the academic request, if the content is simple then it may be easier for the academic to undertake rather than use

Knowledge-Base Forum to source content. Knowledge-Base Forum can be ideal when content sought is complex; in this scenario academic requires expert and in this case Knowledge-Base Forum is invaluable. The help with content will help academics manage their workload in online presence as it will save time and labour.

What has to be understood is that current e-learning applications such as Blackboard and Moodle provide many functionalities and services to help in a learning environment. E-learning environment consists of applications that communicate with student whether in text or video form, it has a place to share data, it has a place for assessment, and it has a place to submit student assignments and course work. Google Scholar and other application like it have beneficial uses for academics to search academic content and all together make up the e-learning environment however all these applications lack content provision that will help academics and will contribute to the e-learning environment.

5.8 Conclusion

Objective one was to investigate the effects of e-learning, in order to investigate this issue a literature review was completed and a first round of interviews took place that pointed to many ill effects. One particular disadvantage stood out: the time factor. Academics were concerned about the longer hours in their job role as online activity increased. This led on to objective two, to find and address the changing requirements in academics role related to increasing time spent on e-learning tasks, since an increase in the time factor is a critical disadvantage caused by online learning systems.

For this reason developing a prototype solution as stated in objective 3 and 4 was a goal of the market research that was completed and piloted. The post-prototype interview showed academics are optimistic about this technical solution; they liked the idea. They stated it is useful and it will save time aiding their role as academics. Further, it is simple to use and academics would recommend Knowledge-Base Forum to their colleagues.

Three out of four academics were very interested after trialling Knowledge-Base Forum, their reaction to the prototype was positive and showed enthusiasm for the prototype. These academics found it simple to use, they were smiling and showed no sign of annoyance or frustration. Two academics were novice computer users, they also thought it was easy to use and few steps required completing a task.

An acknowledgement must be made that an academic did have reservation for this prototype application, primarily because he cannot see academics contributing content for free and since he has large network of colleagues who provide him with support. His argument was addressed and counteracted in section 5.7, as academics do contribute freely to journal publications. Other academics especially new academics may not have a support network therefore they can benefit from Knowledge Base-Forum.

This study has clearly shown the prototype positive light and addresses issues stated in the research aim. The academics trialling the prototype have said it would save time, it would help with workload, and Knowledge-Base Forum would help with networking with other academics.

This study has taken an academic perspective on understanding the challenges that academics face due to the introduction of e-learning technology. It has identified the novelty of this field, as demonstrated in the literature review that the majority of research in the field of e-learning is from the student's perspective. The aim of this research was to explore the extent to which e-learning applications have increased academic workload and then to develop a technical solution to mitigate a perceived detrimental effect. As the investigation progressed it became clear from both existing literature and findings from the conducted interviews that academics are spending long hours using e-learning systems to carry out their duties. Therefore academic workload and time spent using e-learning systems became a focus of the research.

Interviews were undertaken with twelve higher education academics from different institutions within UK. The findings provided a deep insight of the use of e-learning technology, identifying a number of benefits, drawbacks and a wish list of suggested improvements by academics. This information is a real contribution to knowledge in the field of e-learning from an academic perspective. The number of drawbacks stated by academics and the wish list of e-learning potentials is not currently found amongst literature. These findings were made possible because during the interviews the academics were not frightened to criticise either their e-learning system or their institution; rather they welcomed the exercise as one that institutions could learn from.

The literature review findings showed that the most popular e-learning system used in the higher education market in the UK is Blackboard followed by Moodle. However, findings from the interviews showed that these academics viewed all computing based technology, which helps them to support communication and teaching, as part of the e-learning system.

The first analysis of the interviews (section 4.2.1) showed that e-learning systems are used as a tool for research, communication and preparation of teaching materials. These activities are necessary for academics to fulfil their role. E-learning systems are comprised of multiple applications bundled up into one package such as

Moodle or Blackboard. Other applications, such as Facebook and YouTube, are often used by academics to communicate and share materials with their students.

For these academics, any computing tool that can be used to facilitate learning in general is seen as part of the e-learning system. The academics who took part in this research did not make a clear distinction between the different virtual learning systems, such as Blackboard and Moodle. Whilst each application brings about its own positive additions to the e-learning environment, no favourites were highlighted during this research. Overall the consensus of the research was that the e-learning environment as a whole brings many benefits to academics (see Chapter 4, table 4.1).

6.1 Key findings

The findings unique to this research are that the role of academics does not always entail a quasi-permanent online presence, in fact, for some academics it is a reality as they have stated unequivocally. The use of e-learning technology in UK higher education can be a full time occupation, a permanent online presence is necessary to support their academic duties, for academics this is too much, too onerous and time consuming.

6.1.1 More disadvantages listed than advantages

It is evident from the research results that the drawbacks to e-learning technology outweigh the number of benefits. The findings suggest there are eleven advantages in contrast to twenty-nine disadvantages when using e-learning systems (see Chapter 4, table 4.1 and 4.2). However, it is apparent that the twelve advantages are so beneficial that the implementation of this technology is deemed worthwhile for institutions, and they therefore choose to bear the greater number of disadvantages.

There has been much published literature that discusses the issues with e-learning systems, none have identified all twenty-nine disadvantages. As a consequence it is deemed from this investigation that e-learning has changed the role of academics in a negative way.

6.1.2 Academics spend too much time on e-learning

The numbers of hours that some academics spend using e-learning systems are high. In this investigation, one academic stated he uses the system for up to 40 hours a week on top of his teaching. Other academics stated in their interview that they use e-learning systems for up to 20 hours a week on top of their teaching activities (see section 4.2.9). It is hard to believe any organisation could have foreseen such a drastic impact on their staff working hours through the use of such a tool. The existing literature does not highlight the increase in working hours to such an extent. However institutions could have conducted extensive trialling when deciding to implement an e-learning system, and therefore foreseen such a drastic effect on academics working hours. Some of the academics interviewed stated that higher education institution rushed into the introduction of e-learning without an investigation of feasibility.

What is surprising is that the academics who spent up to twenty hours a week working with e-learning did not feel it was time poorly spent, because they believed it would result in a better learning experience. This was particularly true amongst those academics who wished to create clear and well-designed presentations. Preparing presentations, answering questions through email, student contact through mobile devices and forums, collectively add up to a significant amount of time spent using variety of e-learning tools which are a problem.

Whilst the benefits of e-learning are apparent, academics need to overcome the challenge of the management of working hours, as this research shows that e-learning use increases the working hours of academics.

6.1.3 Changes to academic roles

All interviewed academics stated that changes in their roles are related to increased hours of online activity, such as communication and interaction between them and their students (see 4.2.3).

Analysis of data collected from academics shows that longer working hours are a consequence of e-learning technology, for example the need to use e-learning for an additional 40 hours on top of their lecturing. However, their role as a teacher has not

changed fundamentally. E-learning has affected the way materials are created, and how they are communicated and presented to achieve learning. It has affected academics' understanding of the learning styles of their students because they are neither able to see them or interact with them. Training to use the e-learning system, understanding of individual learning styles, and understanding how to command the virtual environment, all add to working hours. This research has identified longer working hours as a change in the role undertaken by academics.

6.1.4 Complexity is underestimated

An academic eloquently stated in their interview that some colleagues find Microsoft Word difficult therefore e-learning is daunting for them, as e-learning generally appears to be more multifaceted than Microsoft packages (section 4.2.3, list item 9).

Some academics do not use e-learning technology and are resistant to any changes. A possible explanation could be a symptom of the complexity of e-learning technology. In understanding how to complete complex tasks, this research has highlighted that academics require practical hands on help rather than few hours of online training or a self-help document that uses terminology that is not always easily understood. Literature has already indicated training requirements for academics, and this research contributes unequivocally to this field.

6.1.5 The e-learning wish list

Through the interviews academics suggested a wish list that would help them with e-learning technology. The wish list comprised thirty suggestions of how e-learning can be adjusted to help in their role (see section 4.3 and Appendix 7). A key contribution of this research is that majority of the suggestions were not technical ones, rather they were managerial issues, or identified the need for effective support and enhanced training.

The technical suggestions that academics mentioned are solutions in existence in the market through various software vendors. It is possible that institutions have all the applications that academics want, however not all academics are aware of it. For example, for visual video conferencing through SKYPE is available, and for uniformity there are configuration settings in Blackboard and Moodle to create a

standard compatibility and integration. Even though Blackboard is limited to its corporate environment, however, applications such as Moodle are open source and can be incorporated and integrated with other systems.

6.1.6 The need to improve training

Findings from the interviews demonstrated that the majority of academics undertake e-learning training. Some academics did not receive training as a result of personal choice; they did not wish to partake in training because they felt it wasted their time either because they could figure out how it works themselves, or for some, they did not like IT based technology and were not interested in training for use in their courses. However, the interview data also showed that those who were resistant to e-learning training could be willing to change their minds if they thought that e-learning could benefit them.

The need to improve training came up many times during the research. Respondents felt that more help should be offered, as current training is inadequate. E-learning technology is always changing and more improvements and additional applications are designed and embedded within the technology to enhance teaching, so constant retraining is required. Institutional management should provide solutions to these problems. Complex tasks should be broken down and made simple, and poor interfaces should be improved. By improving poor interfaces, academics would find it easier to understand the functionality of the systems, and therefore, less training should be required.

Additionally, training should be differentiated to incorporate the different levels of users: part time and full time academics; the beginners and advanced. For the beginners, there should be more focus on the practical benefits of e-learning, easy and practical ways to go about implementing the steps, making ways of gaining self-help attractive, and showing how to easily find answers to problems. Institutions could reduce training if they resolved the poor user interface setup, the complexity of academics tasks or stopped assigning too many tasks, and instead understood that the approach to training should be revised as detailed above. To note, this research has not delved into the training opportunities of part time academic staff. Their

requirements are possibly different to the full time staff and their needs should be taken into account.

6.1.7 Frustrated and annoyed but ready to give another shot

This research has revealed that academics often get frustrated with e-learning technology as a result of coping with multiple disadvantages (see section 4.2.8). The solution to this problem is to reduce as many of the disadvantages as possible; in theory removing one disadvantage will remove a fraction of academics' annoyance and frustration. Academics also stated that they were pressured into using the technology (section 4.3.1 and 4.3.3). They have stated they would 'have a go' if they could be convinced that technology helped to facilitate learning. This shows a lack of awareness on the part of institutions, by not doing enough to reach out to these academics.

Institutions should pay attention to the standard model of technology adoption briefly discussed in section 2.10. Attention needs to be paid to the laggards where researchers of this field suggested that each of them requires different reasons for adopting technology. The statements made by a few academics in this research as the late adopters or the laggards is that they just need convincing that technology can help, if that happened then they would have a go (see section 4.3.3).

It is important to develop better ways to communicate the benefits of e-learning technology to those academics that are anti-technology and non-supportive of its use. Adverts and snapshots of the benefits of technology can be incorporated into an institution's website, training materials and any other advertising medium that it uses to communicate messages to its staff. This should help get resistant academics on board. If institutions do not market their technology, there will always be opposition from academics as they will not see the benefits of the change. Although this is not something this study aims to find a solution to, it has identified that marketing the technology would be an asset for an institution.

6.1.8 E-learning platforms: are they required?

There were many negative points raised by academics about e-learning, but as Blackboard was the primary system used by the academics participating in this research, the main disadvantages listed were reflective of the Blackboard system. It is interesting to note that none of the academics mentioned a single disadvantage of applications such as Microsoft Office Suite, Internet, email, or conferencing tools such as SKYPE. This can be possibly be explained by failings such as complexity, expectation and training associated with Blackboard.

Another explanation is that Blackboard does not just provide the front end functionality but links to a management back end process that enables the institution management to control and monitor the institution's business and allows for reporting. The negative points raised by the academics may relate to these management processes and decision making rather than the actual Blackboard software. More research into their reasons for negative comments needs to be determined by additional research to make solid conclusions. However, even application such as Microsoft Word has a linked managed process. For example, academics using Microsoft word save in a particular networked resource that is managed, paid for, has technical, network, and upgrade issue as does Blackboard. Institutions have multiple computer systems that academics use, but it seems unusual that none is mentioned save Blackboard.

Also unique to this research is the fact that the academic staff who were interviewed pointed out benefits and drawbacks to the technology. Surprisingly, academics who do not use technology and those who were in opposition to the e-learning system suggested some of the benefits. This supports two aspects: firstly e-learning is here to stay; and secondly the technology has serious challenges and expectations to meet.

6.1.9 Replace current software vendors

The question raised through this research was whether paying large sums of money to software vendors such as Blackboard is worth the price. The main reason for academics to use e-learning is its use as a central repository, email and controlling access mechanism. However, free applications now exist to do all these functions without a fee. Blackboard has multiple management functions at the back end, for example access control to courses, materials, marking and grades, and group work that only the relevant student or group of students see. However this management functionality in not unique to Blackboard; free online applications such as Facebook, YouTube and Google folders allow access control to enable the correct individuals or groups to see only relevant files or folders. These applications allow for a central repository, email, chat and many other applications that are similar to that of Blackboard. Therefore the utilisation of free online applications such as Facebook, YouTube, Skype and Google as opposed to a fee paying platform such as Blackboard should be investigated by institutions.

The potential of Facebook, YouTube and Google and other applications to be used as an e-learning system alternative to Blackboard may be difficult for some institutions to comprehend, due to their lack of knowledge of the existing functionalities of these applications. However, there are free e-learning systems that are open sourced and being used by various organisations to fulfil their learning management. An established free, open source e-learning system is Moodle and various examples exist where established UK institutions have migrated Blackboard to Moodle. An example is Middlesex University (see section 2.9), who moved from Blackboard to Moodle because Blackboard does not provide popular applications such as Wikis, podcasting, E-Portfolio, RSS and Web2.0, which are vital tools for learning. Clearly Middlesex University and other institutions have decided that Blackboard is no longer a cost effective solution to support their students' learning.

6.1.10 Incorrectly implementing e-learning in institutions

Findings from the interviews demonstrate issues with uniformity in how academics view the home page of the e-learning application. This differs from academic to academic. This suggests that e-learning systems are not always set up correctly, in that there is no set standard profile and menus. The general look and feel should be same for all users, it is understandable that academics have certain preferences they change such as colours, text size or having pictures in their profile, but changes to menus and links to application should remain and be constant at the same position. These features are configurable with Blackboard or Moodle, suggesting that set up is not correctly done which is causing some of the negativity toward e-learning systems (Section 4.2.2, List 4.2, item 12).

6.2 The prototype

Academics who were interviewed stated their resistance towards the use of e-learning technology. Because of this, it was imperative to find ways to help academics by investigating their needs and creating an environment that satisfies their technology needs, so that they are more comfortable with the use of e-learning systems, and more comfortable with their implementation.

Analysing the academics' wish list alongside the disadvantages that they noted in the interviews (see Chapter 4) led to the creation of the prototype Knowledge-Base Forum. The prototype solution was designed to help counter one drawback – the increase in working hours spent on e-learning activities. Part of e-learning activities of an academic is the creation of content material for teaching and research. If the prototype can reduce the length of working hours on content creation, the time spent on researching, and its articulation and presentation, then the outcome would lead to a reduction in online presence using e-learning technology, and this would help academics in their role.

To conclude, one of the objectives of this research was to identify the effects of e-learning technology on academics. Findings pointed to a number of disadvantages of using this technology; one in particular stood out which was the time factor.

Academics were concerned about the longer working hours required as online activity increased. The prototype application trialled by academics stated that it saves time, because it allows content to be requested by academics and distributed to a pool of expertise. While the academics remain in control of asking for the information they require, it is not a search base solution where tonnes of information have to be sifted, hoping some information may be relevant to an academics' need.

Participants involved in the trialling of the prototype application said it was easy to use, saves time and can reduce workload (see 5.61, 5.6.2 and 5.6.3). Referring to the findings of the interviews, one of the problems discussed was concern about the effectiveness of the training provided by institutions and others. Academics raised concerns that e-learning technology caused them annoyance and frustration. The prototype application was a simple design, allowing non-computing academics to navigate the application with ease. This ensured that it was easy to deal with, resulting in less stress in understanding the application, help with some of the negative aspects of ineffective training, and the reduction of annoyance and frustration.

The second objective of the research was to find and address the changing requirements of academics' roles. Hence, developing a prototype solution that solves extra working hours and ease of use was a goal of this research.

Objective three was to define a framework for the solution that was developed, since increased working time was the issue academics were most concerned about. The analysis of collected data showed that academics prefer it when students are able to help themselves in learning, through a community based learning approach and increased student participation. The analysis showed the preparation of course materials took a great deal of time to develop, along with searching through websites, books and journals to find the correct content. The Knowledge-Base solution was designed for a scenario such as this.

This leads finally to a discussion of the fourth objective, which involved the design, development and evaluation of a prototype based on the technical solution proposed. The prototype that was developed to fulfil this objective is compatible with Blackboard, Moodle and other web based applications that academics are familiar

with. The prototype model reflected the suggestions and wish list made by academics.

6.2.1 Further developments of the prototype

Academics suggested the Knowledge-Base Forum should only have members "who have academic credentials as anyone else may waste time and bring bad repute to the system" (Interview with Dr. UH), therefore Knowledge-Base Forum should consider a verification process of academic members. A suggestion was made to incorporate networking element such as Linkedin functionality where academics can keep in touch with colleagues they have worked with (Interview with Dr. AK). Another suggestion is that length of the article should be set as the requesting academics' wishes; within this research there was not time to put in policies that allowed academics to put restrictions such as the size of content and any other particulars that academics would find useful.

Further research and development is required to explore the various ways of adding online incentives to Knowledge-Base Forum, so that contributors are encouraged to use the application. A suggestion was made by an academic during the trial of Knowledge-Base Forum, that it could be used for communication purposes between academics. Therefore Knowledge-Base Forum should have additional functionality to allow members to invite other academics and professionals to join this group as members. This gives academics the opportunity to network and increase the forum's community by peer recommendation.

The development of the Knowledge-Base prototype serves as a basic example to demonstrate and test with small number of participants how the application could work; the purpose at this stage was to understand if academics liked the idea of having a bidding process to gain content. To perfect the prototype, a further stage of development would be required. A stronger trial would then be needed to test the prototype, and amend it to a level that would be satisfactory to implement on a large scale.

6.3 Implications for literature

E-learning has been met with various opinions across academia, from those who believe e-learning to be superior to those who believe it to be a complete failure. The discussion around its use should be viewed in a balanced way; where e-learning technology is appropriate it should be encouraged, where it is ineffective it should be reduced.

The literature review showed how e-learning technology has emerged as one of the most innovative uses of technology to aid and deliver learning. E-learning technology breaks down geographical boundaries in terms of access, allows effective communication and creates a centralised shared space for administration. Additionally, e-learning technology allows academics the capacity for global participation, and integration of academic standards and views. This has led to higher expectations of academics in regards to students learning, demand for instantaneous feedback, for academics to participate in global events and to be aware of global educational developments. The implication for academics: the greater the use of e-learning technology the longer the working hours and higher expectations. The e-learning benefit of global participation, simultaneous activities and workload increase results in greater cognitive effort and this is supported by literature.

As e-learning systems are evolving to incorporate various pedagogical, administration, reporting and teaching functionalities the more complex the systems have become. In this environment, academics need to understand different learning styles and implement a pedagogy strategy for best learning outcomes. Which is time consuming and increase in academic workload. This research builds on these challenges and was the basis for the development of the advantages and disadvantages list in section 4.2, and the academics' wish list in section 4.4.

The academics' wish list contains many suggestions as to how academics can be helped in their use of e-learning technology. Examples of their wishes include technical support and technology training. This research therefore has implications for the literature surrounding e-learning as it supports what has already been published but also expands on it. This research encourages further research and

greater attention to be paid on the disadvantages of e-learning and the wish list developed to help academics.

6.4 Limitations

The first phase interviewees numbered twelve, which was sufficient to begin to explore this area, it would be a reasonable objection to suggest this number is not sufficient; however participant transaction logs strengthened the interviews. And an increase in the number up to fifty or sixty would raise the same objection: is it sufficient, and in my opinion the core findings would not be dissimilar.

The Knowledge-Base Forum needs a stronger trial to determine the full impact, i.e. how many hours will it save an academic. The stronger trial would require substantive members of content contributors, which was not possible during this research time period. Some of the crowd sourcing system required thousands of contributors to make it succeed and years to establish credibility. Therefore a campaign of marketing, strong financial backing and indefinite time is required to produce a successful trial.

6.5 Further Research

It has been over a decade since e-learning was implemented across UK higher education institutions and yet it is not clear if this technology has ever been used effectively since its deployment. The formulation of a framework that has credibility amongst institutions is required in order to determine the effectiveness of e-learning. A further study of this type is needed.

The role change of academics has been initiated by technology. Further studies should be carried out into how management approaches should change according to the need of academics. It would be of interest to academics to have research that investigates just how institutions plan to resolve or compensate academics who are working extra hours to fulfil their roles. Those academics spending long hours answering student emails and conducting research for presentations require

compensation and recognition. Academics have mentioned the effects of technology, but the issue here is that it requires guidelines to manage academic expectations. Guidelines are also required for managing student expectations, improving e-learning systems' interface design, and improve operational efficiency to reduce cognitive load on academics.

Most of the academics interviewed were not in senior management positions, except for one academic interviewed who serves as Deputy Dean. In his view the majority of academics spend about two hours a week using the e-learning system. The finding from this research is that some academics spend many more hours on such systems, which highlights a potential disconnect between academics' working hours and the impression of their time by institutional management. Further studies interviewing more academic senior managers to confirm this view would be interesting. Should this view be present across the senior management team, more should be done to highlight the effects of e-learning on academics working hours, so that institutional management could find ways to be supportive.

References

Abeyasekera, S. (2005). Quantitative analysis approaches to qualitative data: why, when and how?.

Alavi, M., Marakas, G. M., & Yoo, Y. (2002). A comparative study of distributed learning environments on learning outcomes. Information Systems Research, 13(4), 404-415.

Allan, J. and Lawless, N. (2004) Understanding and reducing stress in collaborative e-learning. Electronic Journal on e-learning, Volume 2, Issue 1, Page 121-128.

Allan, H. T., O'Driscoll, M., Simpson, V., & Shawe, J. (2012). Teachers' views of using e-learning for non-traditional students in higher education across three disciplines [nursing, chemistry and management] at a time of massification and increased diversity in higher education. Nurse Education Today.

Ally, M. (2004). Foundations of educational theory for online learning. *Theory and practice of online learning*, 3-31.

Alreck, P. L., & Settle, R. B. (1995). The Survey Research Handbook: Guidelines and Strategies for Conducting a Survey, 2E.

Applebome, P. (1999). Distance Learning, education.com. The New York Times Archives. Accessed on 15 Dec 2014.
Available at: http://www.nytimes.com/1999/04/04/education/distance-learning-educationcom.html?src=pm&pagewanted=1

Andersson, C. and Runeson, P. (2006). A spiral process model for case studies on software quality monitoring - method and metrics. Software Process journal: Improvement and Practice, Vol: 12, page 125-140. Available at: http://www3.interscience.wiley.com/cgi-bin/h

Arabasz, P., Pirani, J. A., & Fawcett, D. (2003). Supporting e-learning in higher education. EDUCAUSE Center for Applied Research.

Archibugi, D., & Michie, J. (1995). The globalisation of technology: a new taxonomy. *Cambridge Journal of Economics*, *19*(1), 121-140.

Arksey, H. and Knight, P (1999) *Interviewing for social scientists*, London: Sage.

Banning, M. (2004). An illuminative evaluation of the teaching and learning experience of participants' teaching and studying on an independent nurse prescribing course. EdD thesis. Unpublshed.

Blatchford, P., Bassett, P., & Brown, P. (2011). Examining the effect of class size on classroom engagement and teacher–pupil interaction: Differences in relation to pupil prior attainment and primary vs. secondary schools. Learning and Instruction, 21(6), 715-730.

Blignaut, S., & Trollip, S. R. (2003). Developing a taxonomy of faculty participation in asynchronous learning environments—an exploratory investigation. *Computers & Education*, *41*(2), 149-172.

Boisvert, L. (2000). Web-based learning. Information Systems Management, 17(1), 35-41.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative research in psychology, 3(2), 77-101.

Broszik, D. and Zapalska (2006) Learning styles and online education. Campus-Wide Information Systems.Vol. 23, No.5, 2006, pp.325-335. Available at: www.emeraldinsight.com/1065-0741.htm

Brown, T. (1999). Challenging globalization as discourse and phenomenon. *International Journal of Lifelong Education*, *18*(1), 3-17.

Browne, T., Jenkins, M., & Walker, R. (2006). A longitudinal perspective regarding the use of VLEs by higher education institutions in the United Kingdom. *Interactive Learning Environments*, *14*(2), 177-192.

Bryman, A., & Bell, E. (2007). *Business research methods*. Oxford University Press, USA.

Bryant, S. L., Forte, A., & Bruckman, A. (2005). Becoming Wikipedian: transformation of participation in a collaborative online encyclopedia. In Proceedings of the 2005 international ACM SIGGROUP conference on Supporting group work (pp. 1-10). ACM.

Boehm B, W. (1998) A Spiral Model of Software Development and Enhancement. Computer Magazine, IEEE, Available at: http://www.cs.usu.edu/~supratik/CS%205370/r5061.pdf

Boyd, L. (2014). Exploring the utility of workload models in academe: a pilot study. Journal of Higher Education Policy and Management, 36(3), 315-326.

Boyle, T., Bradley, C., Chalk, P., Jones, R., & Pickard, P. (2003). Using blended learning to improve student success rates in learning to program. Journal of educational Media, 28(2-3), 165-178.

Burd, A and Buchanan (2004) Teaching the teachers: teaching and learning online. Reference Service Review, Vol. 32, No. 4, pp 404-412

Burn, J. and Robins, G. (2003) Moving towards e-government: a case study of organisational change process. Logistic Information Management, Vol. 16, no. 1, pp25-35

Burnes, B. (2004). Kurt Lewin and the Planned Approach to Change: A Re-appraisal. Journal of Management studies, 41(6), 977-1002

Callaghan, V., Gardner, M., Horan, B., Scott, J., Shen, L., & Wang, M. (2008). A mixed reality teaching and learning environment. In *Hybrid Learning and Education* (pp. 54-65). Springer Berlin Heidelberg.

Campbell, M., Gibson, W., Hall, A., Richards, D., & Callery, P. (2008). Online vs. face-to-face discussion in a Web-based research methods course for postgraduate nursing students: A quasi-experimental study. International Journal of Nursing Studies, 45(5), 750-759.

Chapman, A. (2012). Future VLE Recommendation Report for Middlesex University, London. Middlesex University. Available at: https://futurelearningtechnologies.wordpress.com/2012/01/25/future-vle-scoping-study-report/. Accessed on 01 July 2014.

Chen, C. C. and Yang, S. C. (2006) The efficacy of online cooperative learning systems, the perspective of task-technology fit. Campus Wide Information Systems Vol. 23 No. 3. Available at: ww.emeraldinsight.com/1065-0741.htm

Chen, S. H. (2011). A performance matrix for strategies to improve satisfaction among faculty members in higher education. Quality & Quantity, 45(1), 75-89.

Cheon, J., Lee, S., Crooks, S. M., & Song, J. (2012). An investigation of mobile learning readiness in higher education based on the theory of planned behavior. Computers & Education, 59(3), 1054-1064.

Childs, S, Blenkinsopp, E, Hall, A, and Walton, G (2005) 'Effective e-learning for health professionals and students—barriers and their solutions. A systematic review of the literature—findings from the HeXL project', *Health Information & Libraries Journal*, 22 pp. 20–32

Chua, B. B., & Dyson, L. E. (2004, December). Applying the ISO 9126 model to the evaluation of an e-learning system. In Proc. of ASCILITE (pp. 5-8).

Clark, J. (2001). Stimulating collaboration and discussion in online learning environments. *The Internet and Higher Education*, *4*(2), 119-124.

Clegg, S., Hudson, A., & Steel, J. (2003). The emperor's new clothes: globalisation and e-learning in higher education. *British Journal of Sociology of Education*, *24*(1), 39-53.

Cole, M. (2009). Using Wiki technology to support student engagement: Lessons from the trenches. Computers & education, 52(1), 141-146.

Conrad, D. (2004) University instructor's reflections on their first online teaching experience. JALN, Volume 8, Issue 2

Copley, J (2007) 'Audio and video podcasts of lectures for campus-based students: production and evaluation of student use', *In Innovations in Education and Teaching International*, 44 (4) pp. 387-399.

Cornelius, S. and Macdonald, J (2008). Online informal professional development for distance tutors: experiences from The Open University in Scotland, Open Learning Vol. 23, No. 1, 43–55ISSN 0268-0513 print/ISSN 1469-9958 online

Cowan, N. (2001). The magical number 4 in short-term memory: A reconsideration of mental storage capacity. Behavioral & Brain Sciences, 24, 87–114.

Creswell, JW. (2012). *Qualitative inquiry and research design: Choosing among five approaches*. SAGE Publications, Incorporated.

Cross, J. (2004),"An informal history of eLearning", On the Horizon, Vol. 12 Iss: 3 pp. 103 – 110. Web link to this document: http://dx.doi.org/10.1108/10748120410555340. Accessed on 21-12-2012

Crotty M. (1998). The foundations of social research: meaning and perspective in the research process. St Leonards, NSW: Allen and Unwin,

Denzin, N. K., & Lincoln, Y. S.(2000). Introduction: The discipline and practice of qualitative research. Handbook of qualitative research, 1-28.

Diao, Y., & Sweller, J. (2007). Redundancy in foreign language reading comprehension instruction:
Concurrent written and spoken presentations. Learning and Instruction, 17, 78–88.

Dockery, R. (2008) Online Learning Communities, Multicultural Education & Technology Journal, Vol. 2 I ss: 1, pp.60 - 64

Donahue, N., & Glodstein, S. (2013). Mentoring the needs of nontraditional students. Teaching and Learning in Nursing, *8*(1), 2-3.

Dosher, B. (2003). Working memory. In Encyclopedia of cognitive science (Vol. 4, pp. 569–577). New York: Wiley.

Dublin, L (2004). The nine myths of e-learning implementations: ensuring the real return on your e-learning investment. Industrial and Commercial Training, Volume 36, Number 7, 2004, pp291-294, www.emeraldinsight.com/0019-7858.htm

EduTools (2009). CMS: Product List. Retrieved March 02, 2009 from http://www.edutools.info/item_list.jsp?pj=4

Elgort, I. (2006, December). e-learning adoption: Bridging the chasm. In Proceedings of ASCILITE (pp. 181-185).

Ellis, A., O'Reilly, M., & Debreceny, R. (1998). Staff development responses to the demand for online teaching and learning. Southern Cross University, ePublication@SCU. Retrieved 01 Jan 2010. Available at: http://epubs.scu.edu.au/tlc_pubs/39/

Evans, C. (2008). The effectiveness of m-learning in the form of podcast revision lectures in higher education, In Computers & Education, 50 (2) 491- 498.

Eynon, R. (2005). The use of the internet in higher education: Academics' experiences of using ICTs for teaching and learning. In Aslib proceedings (Vol. 57, No. 2, pp. 168-180). Emerald Group Publishing Limited.

Farmer, J. (2004). Communication dynamics: Discussion boards, weblogs and the development of communities of inquiry in online learning environments. 21st ASCILITE Conference, 274-283. 20 Jan 2013. Available at http://www.ascilite.org.au/conferences/perth04/procs/farmer.html

Feldstein, M., & Masson, P. (2006). Unbolting the chairs. eLearn Magazine, 2006(1), 2.

Folley, D. (2009). The lecture is dead long live the e-lecture. In 8th European Conference on E-Learning, University of Bari, Italy, 29-30 October 2009 (p. 204). Academic Conferences Limited.

Folley, D. (2010). The lecture is dead long live the e-lecture. Electronic Journal of e-learning, 8(2), 93-100.

Garrison, D.R, and Kanuka, H (2004). Blended learning: Uncovering its transformative potential in higher education, The Internet and Higher Education, 7 (2), 95–105

Gerrard, C. (2005) The evaluation of a staff development (pilot) programme for online tutoring: a case study. Campus-Wide Information Systems, Vol. 22, No 3.

Gerrard, C. (2002). Promoting Best Practice for E-tutoring through Staff Development, In Proceedings of Networked Learning 2002: Third International

Conference, Lancaster University and University of Sheffield 26th March - 28th March 2002.

Ge Jian, D., Hui, L., & Tingting, Z. (2010, July). A preliminary study of personal learning environment based on Ubiquitous Computing Model. In Ubi-media Computing (U-Media), 2010 3rd IEEE International Conference on (pp. 350-354). IEEE.

Grunwald, T., & Corsbie-Massay, C. (2006). Guidelines for cognitively efficient multimedia learning tools: educational strategies, cognitive load, and interface design. Academic medicine, 81(3), 213-223.

Guba, E. (1990). The Paradigm Dialog, Thousand Oaks, CA: Sage.

Gustafson, P., & Gibbs, D. (2000). Guiding or hiding? The role of the facilitator in online teaching and learning. Teaching Education, 11(2), 195-210.

Govindasamy, T. (2001). Successful implementation of e-learning: Pedagogical considerations. The Internet and Higher Education, 4(3), 287-299.

Hall, B. (1996) Adult education and the political economy of global economic change, in P. Wangoola and F. Youngman (eds), Towards a transformative political economy of adult education: theoretical and practical challenges (Illinois: LEPS Press).

Hannon, J. D'Netto, B. (2007). Cultural diversity online: student engagement with learning Technologies. International Journal of Educational Management Vol. 21 No. 5, 418-432.

Hardaker, G & Singh, G& (2011). The Adoption and Diffusion of eLearning in UK Universities: A Comparative Case Study Using Giddens's Theory of Structuration. Campus Wide Information Systems, 28(4), 221-233.

Heijstra, T. M., & Rafnsdottir, G. L. (2010). The Internet and academics' workload and work–family balance. The Internet and Higher Education, 13(3), 158-163.

Heinrich, E., Milne, J., & Moore, M. (2009). An Investigation into E-Tool Use for Formative Assignment Assessment-Status and Recommendations. Educational Technology & Society, 12(4), 176-192.

Hiltz, S. R (2003). The virtual classroom: Learning without Limits via Computer Network, Albex Publishing Corporation, Nor Wood, NJ.

Hillman, S. J., & Corkery, M. G. (2010). University infrastructural needs and decisions in moving towards online delivery programmes. Journal of Higher Education Policy and Management, 32(5), 467-474.

Houston, D., Meyer, L. H., & Paewai, S. (2006). Academic staff workloads and job satisfaction: Expectations and values in academe. Journal of Higher Education Policy and Management, 28(1), 17-30.

Huddlestone, J., & Pike, J. (2008). Seven key decision factors for selecting e-learning. Cognition, Technology & Work, 10(3), 237-247.

Jackson, S., & Fearon, C. (2013). Exploring the role and influence of expectations in achieving VLE benefit success. British Journal of Educational Technology.

Jong, De, T. (2010). Cognitive load theory, educational research, and instructional design: some food for thought. Springer publications. Instructional Science, 38(2), 105-134.

Kalyuga, S. (2007). Enhancing instructional efficiency of interactive e-learning environments: A cognitive load perspective. Educational Psychology Review, 19(3), 387-399.

Khoo, E. G. (2009). Online Learning Communities: A Strategy For Improving Learning. Available at: http://www.academia.edu/6147643/Online_Learning_Communities_A_Strategy_For_Improving_Learning. Accessed on 01-Jan-2014.

Khoo, E. G. (2010). Developing an online learning community: A strategy for improving lecturer and student learning experiences (Doctoral dissertation, The University of Waikato).

Kidwell, P. A, Ackerberg-Hastings, A, and Roberts D, L (2008). The Blackboard: An Indispensable Necessity, 21-34 in Tools of American Mathematics Teaching, 1800–2000. Johns Hopkins University Press, Baltimore.

Kollock, P., & Smith, M. (Eds.). (2002). Communities in cyberspace. Routledge.

Leask, B. (2004). Internationalisation outcomes for all students using information and communication technologies (ICTs), Journal of Studies in International Education, Vol. 8, No. 4, 336-51.

Le Vie, D. Jr(2007)"Writing Software Requirements Specifications". Available at online magazine TECHWR-L:http://www.techwrl.com/techwhirl/employmentarticles/gettingpaid.html)

Liaw, S (2008) 'Investigating students' perceived satisfaction, behavioural intention, and effectiveness of e-learning: A case study of the Blackboard system', Computers & Education, 51 (2), 864-873.

Liaw, S. S., Huang, H. M., & Chen, G. D. (2007). Surveying instructor and learner attitudes toward e-learning. Computers & Education, 49(4), 1066-1080.

Liebowitz, J and Frank, M (2010). *Knowledge* Management and e-learning. Florida: Taylor and Francis.

Loveless, A. (2011). Technology, pedagogy and education: reflections on the accomplishment of what teachers know, do and believe in a digital age. Technology, Pedagogy and Education, 20(3), 301-316.

Luckin, R., Shurville, S., & Browne, T. (2006). Initiating e-learning by stealth, participation and consultation in a late majority institution. Journal of Organisational Transformation & Social Change, 3(3), 317-332.

Lulee, S. (2008). Assessing Teaching Presence in Computer Conference, a Literature Review. San Diego State University.

Macharia, J. K., & Pelser, T. G. (2012). Key factors that influence the diffusion and infusion of information and communication technologies in Kenyan higher education. Studies in Higher Education, (ahead-of-print), 1-15.

Makino, Y. (2007). The third generation of e-learning: expansive learning mediated by a weblog. International Journal of Web Based Communities, 3(1), 16-31.
Mayes, R., Luebeck, J., Ku, H. Y., Akarasriworn, C., & Korkmaz, Ö. (2011). Themes and strategies for transformative online instruction. Quarterly Review of Distance Education, 12(3), 151-166.

Mayer, R. E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. Educational psychologist, 38(1), 43-52.

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2009). Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online. Learning Studies. US Department of Education.

Maxwell, T.A. (2004), "Qualitative Research design an interactive approach", Sage Publications

Maxwell, T.A. (2005), "Qualitative Research design an interactive approach", Sage Publications

Mee, A. (2012). e-learning policy and the transformation of schooling: a UK case study. Learning. European Journal of Open, Distance and e-learning. Available at http://www.eurodl.org/?article=283, Accessed 13 Oct 2013.

Mertens, D. M. (2009). Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods. SAGE Publications Incorporated.

Michaelson, R. (2003, August). Does e-learning work?. In Proceedings of 4th Annual Conference of the LTSN Centre for Information and Computer Sciences, National University of Ireland Galway, Galway, Ireland (pp. 26-28).

Mihhailova, G (2006). E-learning as internationalization strategy in higher education. Lecturer's and Student's perspective. Baltic Journal of Management Vol.1, No.3, p270-284.

Miles, M. B., and Huberman, A. M. (1994). Qualitative data analysis: A sourcebook of new methods. Beverly Hills, CA: Sage Publications

Mohammad, M. (2012). The Impact of e-learning and e-Teaching. World Academy of Science, Engineering and Technology, 62, 408-413.

Moos, D. C, and Azevedo, R (2009). Learning With Computer-Based Learning Environments: A Literature Review of Computer Self-Efficacy, Review of Educational Research, 79 (2), 576-600.

Morley, Graham. (2010). Suggestions to Assist Primary Teachers in Keeping Pace with ICT: Teachers' Experiences in England. In: 2nd International Conference on Education, Economy & Society, 21-24 July 2010, Paris, France. (Unpublished).

Murphy, J. (2003). The changing role of the Universities in supporting e-learning & mobility in Higher Education. In World Conference on e-learning in Corporate, Government, Healthcare, and Higher Education (Vol. 2003, No. 1, pp. 1416-1419).

Kotze T. G. and Nageland, L. (2011). Choosing the best from blended and online e-learning. Progressio, 33(2), 151-173.

Nandi, D., Hamilton, M., Chang, S., & Balbo, S. (2012). Evaluating quality in online asynchronous interactions between students and discussion facilitators. Australasian Journal of Educational Technology, 28(4), 684-702.

Nielsen, D., White, A. S., & Zhou, L. (2011, July). The VLE as the converging platform. In Electrical Engineering and Informatics (ICEEI), 2011 International Conference on, 1-6. IEEE.

Novak, G. M., Patterson, E. T., Gavrin, A. D., Christian, W., & Forinash, K. (1999). Just in time teaching. American Journal of Physics, 67(10), 937-938.

Naumann, J. D., & Jenkins, A. M. (1982). Prototyping: the new paradigm for systems development. Mis Quarterly, 29-44.

Olaniran, B. A. (2006). Applying synchronous computer-mediated communication into course design, some considerations and practical guides. Campus Wide Information Systems Vol. 23, No. 3. Retrieved 13 Aug 2013. Available at: ww.emeraldinsight.com/1065-0741.htm

O'Muircheartaigh, C., & Campanelli, P. (1999). A multilevel exploration of the role of interviewers in survey non-response. Journal of the Royal Statistical Society: Series A (Statistics in Society), 162(3), 437-446.

Orvel, J. (2000). Online counselling and the Internet: Perspectives for mental health care supervision and education. Journal of Mental Health Healer, 9, 2, 121-135.

Palloff, R. M., & Pratt, K. (2007). Building online learning communities: Effective strategies for the virtual classroom. John Wiley & Son

Paulsen, M.F. Online Education Systems in Scandinavian and Australian Universities: A Comparative Study. [Viewed and verified 02 March 2009]. Available at: http://www.nettskolen.com/forskning/57/web-edu%20comparative%20reflections.pdf

Penna, M. P., Stara, V., & De Rose, M. (2009). The failure of e-learning: why should we use a learner centred design. Journal of e-Learning and Knowledge Society, 3(2).

Peters, T. A., Kurth, M., Flaherty, P., Sandore, B., & Kaske, N. K. (1993). An introduction to the special section on transaction log analysis. Library Hi Tech, 11(2), 38-40.

Phipps, R and Merisotis, J. (1999). What's the Difference: A Review of Contemporary Research on the Effectiveness of Distance Learning in Higher Education Journal of Distance Education, Vol. 14, No. 1, 102-114.

Piccoli, G., Ahmad, R., & Ives, B. (2001). Web-based virtual learning environments: A research framework and a preliminary assessment of effectiveness in basic IT skills training. MIS quarterly, 401-426.

Raghuram, P. (2013). Theorising the spaces of student migration. Population, Space and Place, 19(2), 138-154.

Reeder, K., Macfadyen, L.P., Chase, M. and Roche, J. (2004). Negotiating culture in cyberspace: participation patterns and problematics, Language Learning and Technology, 8(2), 88-105.

Rickett, F. (2007). AXSYS: an intelligent system for e-learning. Emerald Insight, Kybernetes, 36(3/4), 476-483.

Roberts, D. L., Leung, A. Y. L., and Lins, A. F. (2013). From the Slate to the Web: Technology in the Mathematics Curriculum. In *Third International Handbook of Mathematics Education* (pp. 525-547). Springer New York.

Rovai, A. P. (2002). Building sense of community at a distance. The International Review of Research in Open and Distance Learning, 3(1).

Salmon, G. (2000). E-moderating: The key to teaching and learning online, Kogan Page, London, 7-10.

Schiller, J. (2003). Working with ICT Perceptions of Australian principals. Journal of Administration Vol. 41 No. 2 2003 pp. 171-185. Available at: http://www.emeraldinsight.com/0957-8234.htm Educational

Selinger, M. (2004). Cultural and pedagogical implications of a global e-learning programme, Cambridge Journal of Education, 34:2, 223-239.

Shu-ying, L. (2010) Study on IT based teaching evaluation. 2010 international conference on computer design and applications, IEEE Explore.

Sidhu, R. K. (2006). Universities and globalization: To market, to market. Routledge.

Smith, M. (1992). Voices from the WELL: The logic of the virtual commons. Masther Thesis. University of California at Los Angeles. Los Angeles. TENET (Texas Education Network)(1996): Curriculum Infusion Guide. Documento electrónico.

Smith, A. D. Morris, R. and Rupp, W. T. (2003). Managerial implications of computer-based online face-to-face business education: a case study on Online Information Review. Vol. 28 No. 2, 2004, pp. 100-109. Available at: www.emeraldinsight.com/1468-4527.htm

Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2004). Improving online learning: Student perceptions of useful and challenging characteristics. The internet and higher education, 7(1), 59-70.

Spring, J. (2008). Globalization of education: An introduction. Routledge

Stefanova, E. Ilieva, M. Nikolova, N. and Stefanov, K. (2008) Turning university professors into competent learners, TENC: Publications and Preprints, ISBN: 978-90-6813-8474. Available at: http://dspace.ou.nl/handle/1820/1484

Steel, J., & Hudson, A. (2001). Educational technology in learning and teaching: the perceptions and experiences of teaching staff. Innovations in Education and Teaching International, 38(2), 103-111.

Sywelem, M., Al-Harbi, Q., Fathema, N., & Witte, J. (2012). Learning style preferences of student teachers: A cross-cultural perspective. Institute for Learning Styles Journal, 1, 10-24.

Taylor, R. W. (2002). Pros and cons of online learning – a faculty perspective. Journal of European Industrial Training, 26/1 [2002] 24-37 Available at: http://www.emeraldinsight.com/0309-0590.htm

Teo, C. B., Chang, S. C., & Gay, K. L. (2006). Pedagogy Considerations for e-learning. International Journal of Instructional Technology and Distance Learning, 3(5), 3-26.

The University of London (2013) International Programmes: Our History, accessed on 02.09.2013: http://www.londoninternational.ac.uk/our-global-reputation/our-history

Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. American journal of evaluation, 27(2), 237-246.

Tomei, L. (2006). The impact of online teaching on faculty load: Computing the ideal class size for online courses. Journal of Technology and Teacher Education, 14(3), 531-541.

Turvey, K. (2008). Student teachers go online; the need for a focus on human agency and pedagogy in learning about 'e-learning' in initial teacher education (ITE). Education and Information Technologies 13, 10, 317–327.

Olaniran, B. A. (2006). Applying synchronous computer-mediated communication into course design: Some considerations and practical guides. Campus-Wide Information Systems, 23(3), 210-220.

Uden, L. (2003). An engineering approach for online learning. International Journal of Distance Education Technologies (IJDET), 1(1), 63-77.

UNESCO (2002) Open and Distance Learning: Trends, policy and strategy considerations (http://unesdoc.unesco.org/images/0012/001284/128463e.pdf).

Vardi, I. (2009). The impacts of different types of workload allocation models on academic satisfaction and working life. Higher Education, 57(4), 499-508.

Volery, T., & Lord, D. (2000). Critical success factors in online education. International Journal of Educational Management, 14(5), 216-223.

Vonderwell, S. (2004). Assessing online learning and teaching: adapting the minute paper. TechTrends, 48(4), 29-31.

Vonderwell, S., Liang, X., & Alderman, K. (2007). Asynchronous discussions and assessment in online learning. Journal of Research on Technology in Education, 39(3), 309-328.

Vonderwell, S., & Zachariah, S. (2005). Factors that influence participation in online learning. Journal of Research on Technology in education, 38(2), 213-230.

Vrocharidou, A., & Efthymiou, I. (2012). Computer mediated communication for social and academic purposes: Profiles of use and University students' gratifications. Computers & Education, 58(1), 609-616.

Wang, W. T., & Wang, C. C. (2009). An empirical study of instructor adoption of web-based learning systems. Computers & Education, 53(3), 761-774.

Wangoola, P., & Youngman, F. (1996). Towards a Transformative Political Economy of Adult Education: Theoretical and Practical Challenges. LEPS Press, Northern Illinois University, DeKalb, IL 60115.

Weber, M (1949) The Methodology of the Social Sciences. Translated and edited Edward A. Shils and Henry A. Finch. New York: The Free Press.

Welsh, E. T., Wanberg, C. R., Brown, K. G., & Simmering, M. J. (2003). e-learning: emerging uses, empirical results and future directions. International Journal of Training and Development, 7(4), 245-258.

Weiss, C. H. (1998) Evaluation: Methods for Studying Programs and Policies. New Jersey:Upper Saddle River.

Wijekumar, K. K., & Spielvogel, J. (2006). Intelligent discussion boards: Promoting deep conversations in asynchronous discussion boards through synchronous support. Campus-Wide Information Systems, 23(3), 221-232. Available at: ww.emeraldinsight.com/1065-0741.htm

Willis J.W (2007) Foundations of qualitative research: Interpretive and critical approach to research. Sage Publications

Xin Bai. (2010, July). Promoting a ubiquitous e-learning framework. In Computer Science and Information Technology (ICCSIT), 2010 3rd IEEE International Conference on (Vol. 1, pp. 496-500). IEEE.

Yassi, A. (1997). Repetitive strain injuries. The Lancet, 349(9056), 943-947.

Zhang, H. Kitchenham J, Jeffery B R. (2008). Semi-quantitative Modelling for Managing Software Development Processes. This paper appears in: Software Engineering ASWEC 2008 19th Australian Conference. ISBN: 978-0-7695-3100-7, pp 66-75. Available at: http://ieeexplore.ieee.org

Zeffane, R. and McLoughlin, D. (2006). Cooperation and stress Exploring the differential impact of job satisfaction, communication and culture. Management Research News, Vol.29 No.10. Available at: www.emeraldinsight.com/0140-9174.htm

Zemsky, R., & Massy, W. (2004). Thwarted innovation: What happened to e-learning and why. The Learning Alliance at the University of Pennsylvania. Retrieved from http://www.irhe.upenn.edu/WeatherStation.html. Accessed on 01-12-2012.

Zhang, D., J. L. Zhao, L. Zhou, and J. F. Nunamaker.(2004). Can e-learning replace traditional classroom learning? Evidence and implication of the evolving e-learning technology. Communications of the ACM
47 (5):75–79.

Zondiros, D. (2008). Online, distance education and globalisation: Its impact on educational access, inequality and exclusion. *European Journal of Open, Distance and e-learning, 1.*

APPENDIX 1: Notes for the candidates

Purpose of the interviews:

These questions are designed to explore the following aims and objectives:

1. To identify the causes and effects of online presence is having on teaching staff.
2. To investigate the changing requirements for supporting teaching staff in their management of their online presence.
3. To propose a model for possible technical solutions that will help the teaching staff.

The format of the interview:

- Standardised - open ended interviews. .
- 12 open-ended questions
- The interview will be tape recorded and notes taken
- Give my contact information..

Confidentiality:

- Personal details will be kept confidential and will not be disclosed to anyone.
- The interview is confidential and will be kept anonymous.

APPENDIX 2: Interview questions:

Find the name of the Software Package used. This will help in planning & developing a prototype or an add-on, if it is required to improve the software. Also this information is useful for me to understand the platform they use.

1. What kind of software technology (Online Learning Systems) do you use to teach? E.g. WebCT, Blackboard

The training is an important part of the research aim. The amount of training in the technology determines to an extent the effects of online learning is having on teaching staff whether it is a positive or negative. Also may the answer to this question may identify the changing requirements.

2. Please describe the types of training you get to use the Online Learning System?

   Suggest: How much training do you get (hours, day, weeks, months), on the job training or designed courses.

   Suggest:Do you think that technology is changing so often that retraining always required?

   Suggest: Do you feels that the training you get is effective and productive?

   Suggest:The online Learning System that you use, can you recommend something you feel if added may make the system help with your training or make it more productive or make it easier.

   Suggest: From your experience is there anything that you would recommend to the institution that will help lectures as yourself in terms of training needs?

Suggest: Would you like it if there was online training added in every section of the Systems

Suggest: What type of training would you like to be added i.e. recorded training, text base, Voice activated & text base AI that can answer your questions.

One of the assumed reasons why technology is being deployed is to make certain tasks easier for the teaching staff and reduce working hours, so perhaps the time saved could be better spent doing other constructive task, such as more administration and reducing academic or teaching tasks.

3. How many hours do you spend with technology for teaching (e-learning system)?

Suggest: Which period of the academic calendar you spend the most amount of time with the e-learning System and why in that period?

Suggest:Do you feel it's too much time or not much time you spend on online learning systems?

Suggest: Do you feel you are compelled to use technology for teaching?

Suggest:Do you feel the increased hour of using online learning systems has affected your role as a teacher?

Changes in job description also will identify the changing requirements

4. Do you think your job role has changed and is changing often due to the e-technology?

Suggest: Please list some changes occurred in your role

Suggest: Do you feel you are doing more repetitive tasks.

Suggest: In your view can there be anything done to improve the situation in the technology.

Suggest: If roles are changing what recommendations would you give to your institute to facilitate the change.

Suggest: Do you have a FQ section for the Students in the course that you teach.

Suggest: Do you think if you were to post something on the Online learning environment to help your students, the same post goes to their email account as an email, to the students mobile, in the FAQ section would it reduce the repetitive tasks.

Common reasons why technology is being deployed is to make life and task easier for the teaching staff, but sometimes the question of health and welfare is not considered before deployment especially psychological concerns. The following question will explore some of the health concern and find some of the effects of online learning.

5. Using technology does it cause you to become frustrated?

Suggest: What type of frustration: you feel anger, resentment, lack of interest in the work, loss of sleep, depression, anxiety etc

Suggest: Is this effecting your teaching, or effecting your motivations.

Suggest: In your view is there anything in the technology which can be added-on to make your role easier or reduce your frustration.

Suggest: Would it help in your view adding some form of therapy advice or relaxation videos in the system

Asking questions, about the benefits of the e-technology in teaching, will help exploring the factors affecting teaching.

6. What do you think are the benefits of using e-technology for instructional purposes and what do you think are the drawbacks of online learning?

   Suggest: Please list benefits from your own experience.

   Suggest: Please list drawbacks from your own experience.

   Suggest: Is there anything in the technology in your view that can be added-on to make those drawbacks more manageable.

   Suggest: Is there anything you would recommend from your experience to the Institution to make those drawbacks more manageable.

   Suggest: Is there anything you would recommend from your experience to the Government or the wider teaching community to make those drawbacks more manageable.

   Suggest:Do you think the future there will be more technology used in teachings?

   Suggest: Do you think by creating a portal where the teaching community can add their views and ideas to help manage the drawbacks or add recommendations a good idea.

   Perhaps a question, thought or a recommendations will be suggested which may help in my task.

7. Is there any information, suggestions or recommendation you like to make on the interview and the subject...?

interview results with academics

Estimate number of hours spent	*Do you feel you spend too much*	*Have they been compelled to use E-learning*	*E-learning platform used*	*Training provided by institution*	*Is the training adequate*	*Has the role changed since E-learning implementation*	*Fustration caused by E-learning*
3-15	No	Not compelled	Blackboard	Yes	No	Yes	Yes
-15	No	Not compelled	Don't know, someone else updates the	Yes	Yes	Yes	No
	No - Does not use it	They are being compelled	None whatsoever, only power point and email system.	Yes, but did attend.	No	Yes	Yes
--40	Yes	Not compelled but the Elearning environment demands it.	Do not use WebCT, Blackboard. However all notes, work, and lectures are all online in his own website.	Yes	Yes	Yes	Yes
n't say, but e it alot	Yes	They are being compelled	Blackboard.	Yes	No	Yes	Yes
	No	They are being compelled	Blacboard.	Yes	Yes	Yes	Yes
	No	They are not being compelled but encouraged	Blackboard	Yes	Yes	Yes	Yes
	No	Not compelled but the Elearning environment demands it.	Blackboard	Yes	Yes	Yes	Yes in the begining but now NO.
20	Yes	Not compelled but the E-learning environment demands it.	WebCT	Yes	Yes	Yes	Annoyance
20	No	They are being compelled	No he does not use any specifics platform although the University has Blackboard. But uses many type of other softw are which is available to help teach mathematics and	Yes	Yes	Yes	Annoyance
	Yes	They are being compelled and forced.	OHP, Power Point, and Electronic Email, Internet to prepare and adapt lesson. But do not use WebCT, Blackboard or any specific E-learning	Yes	No	Yes	Yes
	No	Not compelled but the E-learning environment demands it.	Moodle	Yes	Yes	Yes	No

APPENIDX 4: First phase interviews

This appendix contains a sample of two interviews from the first phase data collection.

Interview with Dr. E

Date: 04-09-2008

Interviewer: Let me ask you the first question if you allow, the first question is what kind of software technology do you use, for online system do you use, Blackboard?

Interviewee: Yes, we have some of our staff up on Blackboard.

Interviewer: Right, so the Blackboard is thing that you use?

Interviewee: [Yes].

Interviewer: Okay Sir. Okay that's my first question so that's simple just bear with me for the second question. The second question is, how much time do you spend with technology for teaching, roughly how many hours average a week?

Interviewee: It depends on what you mean, I mean lots [of us] I mean would do a slide show and I would do something like a presentation on the slide show and much on demonstration and so we per week…

Interviewer: I mean what about – do you use Blackboard to up load your content and everything else and so you don't really tend to use that much?

Interviewee: No I mean at the beginning, we got somebody who tended to that quite a bit, then we do all the course content at the beginning or if we are having problems with it, we actually send this person stuff and they will upload it to the Blackboard for us.

Interviewer: Okay just bear with me for a second. Do you feel you spend too much time on online learning system or do you feel it's too less?

Interviewee: We would do this at the beginning when we actually do the particular module but I would think it is too long..

Interviewer: But this is – the majority of the time spend is at the beginning of the term begins?

Interviewee: Yeah, it would be good if it was spread out over a period but it is too intensive at the beginning.

Interviewer: So do you feel that you are compelled to use technology for teaching this e-learning system specifically?

Interviewee: Yes and no.

Interviewer: Okay yes and no can you just elaborate on that a bit?

Interviewee: Yeah I think it's a very good thing because some of our content is delivered to [national] students on nursing degree, they are in different countries, we've got this collaboration ,that's where we can gauge what they actually feel about this, you are gauging with a student.

Interviewer: Okay, do you feel is that nowadays the institutions they are trying to encourage more use of them, do you think that from your experience using this online learning system has affected your role as a teacher?

Interviewee: It has, let me tell you and we've got a few more senior colleagues or older colleagues who kind of refused pretty much anything to do with it because they just don't feel it's for them, they don't feel it's a effective way of delivering learning. Anybody even though we don't have to use it, we have to go with it because we know that more and more [proceeds] can be delivered this way two weeks ago and they said up to 30% of our country will be by the year 2011I can't remember which on, you know this is a [corporate strategy].

Interviewer: Do you think there is anything in the technology which can be added which can reduce the amount of time you spend with the system because – is there something the system which can make your life easier that can help you in terms – as a result reduce your amount of work, from your experience do you think that you can recommend something?

Interviewee: Yeah I think because through the structure that we put in on Blackboard, I think we could do with more kind of online tutorial systems.

Interviewer: Online tutorial systems, can you describe them a bit more?

Interviewee: On how to actually do things, if you want to put a video in, it's really complicated and we got to get a third party to do that.

Interviewer: Alright so you can't do it yourself if you want to put a video?

Interviewee: No, no that's one of the problems, we've got to go through third party, it depends on how big they are,actually you get delayed and we've got this thinking about how our head of department is crazy about the corporate image, anything that goes via the we call the average learning [equipment], it may have to be kind of looked at before it can be up loaded, so that they can be understood.

Interviewer: So if there is a lot of red tape and bureaucracy.

Interviewee: Putting something simple there but still that has to be kind of rubber stamped before they can actually go on this.

Interviewer: My third question is, do you think your job role has changed and is changing often due to the E-technology?

Interviewee: Oh yes, definitely and...

Interviewer: If something has occurred in your role specifically? Or if you can't just then generally.

Interviewee: Yes, yes, yes because this is a – they are doing some actual courses that can only be on e-learning so far,delivered some things through e-learning and then other things being delivered ,kind of residential. We are doing nurse training and some of them have been coming for three or four weeks at times and the rest being delivered through virtual learning environment but the future, it's going to change,more and more.

Interviewer: Do you feel that there is any repetitive work involved in this technology? Do you feel that one because some people said since increase of technology, I feel that I'm doing the same thing again and again, did you feel that? Again can you explain that, give me an example in that situation?

Interviewee: One thing that's just slightly – when you are teaching in a [trusted] environment, you don't have to write every word down, you might have something. I mean you are in your area and you'll talk around it but in a virtual learning environment everything has to be crystal clear even the simple thing, even a simple online.

Interviewer: It takes a long time to prepare that one line because clarity and preciseness.

Interviewee: Yea, be really clear and [precise] and make sure that it's not misunderstood because in the classroom some people will say, can you explain that a bit more, it's up to them because we cant gauge it and when you are in a classroom you can look at the faces you can [counter] in an instance. I've come to experience you can kindly pick it up, you know they'll start looking at each other, blank faces,further explain more. And sometimes, it feels like you are patronizing [into their league], you put too much about something simple and you are like definitely I'm sure they'll understand that.

Interviewer: If those are changing, what recommendation would you give to your institute to facilitate this change? I mean maybe they are not looking at the grass roots the teachers and the implement the technology and then already facilitating changes, is there anything that you can think of?

Interviewee: I think they need to hold on and I think they need [negotiating] quickly. I think we need to look at the quality, all [they've been] interested in is looking at the numbers and they give us examples of other courses [you might have had] and I think that is an increase in uptake it doesn't mean that we are delivering the good quality and products all because of being a very big uptake, I think they are just running away with it and without even evaluating quality.

Interviewer: Okay right, right. Sorry go on.

Interviewee: They are actually going for numbers and numbers is not everything for me, I'd rather deliver a good quality service.

Interviewer: Do you have any FAQ section for the students in the course that you teach so incase, you usually do?

Interviewee: We do yeah exactly.

Interviewer: Is there anything in your view that can be done to improve the situation in the technology in terms of your role as it's changing maybe something in the technology that can be added in to the help manage that change? Because the more technology being improved – something in the technology that you feel if that was there, that could have made much [to easier], is there anything you think of?

Interviewee: Not anything as such but you know just the technology that we've got some of it is a bit too complicated in application.

Interviewer: One of the example do you think, what's the complaint?

Interviewee: Again you know converting the demonstration video and because they are held in a particular format and I was told that that particular format was not suitable for Blackboard, I had to go back to go back to the people that we got this little probably it was a little sneak view of the procedure and I had to go back to this people and contact them and ask them do we send it in a different format and we couldn't do that up on the Blackboard and I already hinted to the students that they we are going to have a demonstration with thi,ever since it broke down because of the incompatibility of the system. The [question and idea] about that, this argument that you can just sink [WAV] file and upload it and there were go but it wasn't. Another colleague had this problem as well.

Interviewer: My fourth question, is please describe the types of training you get to use the online learning system? How much training do you get or not much, you feel more training could be added in?

Interviewee: Oh yeah more training definitely could be added in because a lot of it is implying it's like I think I went to a demonstration or something on hour or something and then [I went there] like a big – there was quite a lot of us in the room and then it was just put up on the screen and said this is a virtual learning environment, this is what benefit it can bring with you,brilliant and this is what you can be doing and this is how to upload this and how to upload that and how to upload this and that was it.

Interviewer: So you feel that in one year you just caught that one little seminar telling you about it and that's about it?

Interviewee: That was it and the [honors is on us] to take with the person who owns it but again if you send them a query by email you going to get your answer in a week because there is that [inundate] the person running it is a nice person, and secondly I think it's a tiny thing, you don't wait for a week.

Interviewer: I was going to ask you is there a training effective by all productive but since you said you didn't have too many, would you recommend something in the training that you would like to see if they had some training, what do you think that they were missing if they had any training? Can you think of anything like that?

Interviewee: I think another way would be to for them to explain how we can actually convert our teaching material even to a format that would work better. I would probably want to see their training actually for somebody actually to sit with me practically and say look, how can I communicate this across to a virtual learning environment and how it would actually look you know it would be right to use slides like this or would it be right to use a small demonstration video in the middle or how can I actually do this.

Interviewer: Say for example if one of the suggestion was like to add some tutorials or maybe even recorded on each section of the Blackboard and it's optional you go to a section you don't know how to use you just say help and there is a video open, do you think that could be of any help since there isn't much training?

Interviewee: I think over all this, there actually be something where they can help us to streamline the whole thing, maybe not really from my particular module but it should be much more [due understanding] the way of doing something different.

Interviewer: Alright but explain a bit more on that?

Interviewee: Yes, I will. Some of our colleagues are doing things in a particular way and we are doing things differently.

Interviewer: Like for example?

Interviewee: Just looking at the way that material is organized.

Interviewer: Oh material, is that maybe you have a different and somebody else is using something other than Blackboard and you are using Blackboard?

Interviewee: Even in the Blackboard environment there is the content.

Interviewer: It's not uniform at all.

Interviewee: Yeah there is no uniformity and I think [IB] I don't think that's gauging it properly, I don't think – I think it's the other way round, I think we need to [ask] the students a lot more and I know some of the students are from Africa and other countries,it's more difficult for them to be honest and open with us saying that this is rubbish and it's not working, I think muddling along, we know it's not like that but we don't get that right feed back if they don't like it.

Interviewer: Alright thank you very much the next question I was going to ask is, using the technology does it course you to become frustrated?

Interviewee: Oh that's an issue.

Interviewer: Is this affecting your teaching motivation?

Interviewee: Yes sometimes it does, yeah it does.

Interviewer: Do you think there is anything that could be done to the technology which can help you to reduce this frustration, the technology maybe add another technology but some people say well, if you add more technology you will get to be more frustrated?

Interviewee: I think you need to work with what you got you don't necessarily have to add anything, I think it would simplify things and…

Interviewer: Like adding uniformity.

Interviewee: Yes, yes, yes even into the software I mean it's bring it down a level into the software if I put something in there and it [predict] way and it would say, are you sure that you want this format this is not a suitable format which dejects using their format so with that kind of thing that would be better, wouldn't it?

Interviewer: Yes.

Interviewee: That a computer program can kind of lead you a little bit.

Interviewer: Actually sorry my sixth question is, what do you think are the benefits of E-technology for your instructional purposes and your draw backs? So if you can benefits you think.

Interviewee: Benefits are certainly that means we can reach people that we won't otherwise.

Interviewer: And some drawback.

Interviewer: Any drawbacks that you can think of, any disadvantages?

Interviewee: Some disadvantage would be again…

Interviewer: Going back to that same thing of the uniformity and that recording, okay there is too much these drawbacks, is there anything which can be added into the technology maybe you think that can help manage this drawback, is there anything that you think from your…

Interviewee: I think more [guidance] from the technology itself.

Interviewer: More guidance.

Interviewee: Yeah more inbuilt guidance and I think it's time as well you know as time goes on, we need to get more [confidence] with that thing and you get to learn to do things, that they way they should be done it's like sending a new software of package the more that you get to use that software, the more kind of efficient you will become.

Interviewer: Would you recommend something from your experience to the government or the wider teaching community to make this drawbacks more manageable or is it the same suggestion is that more training, more understanding, more uniformity, this type of things?

Interviewee: I think those were the initial but I think really they've got to look at the end user, we need to look at who are [buying] it and that's the student and we've got to look are we delivering the best mechanism for them.

Interviewer: Okay right…

Interviewee: How is it, people do things but it's the positive things, is that the best learning environment for them . I have to think, I don't think it is.

Interviewer: You don't think it is.

Interviewee: Not always, not always for everyone.

Interviewer: Do you think by creating a portal where the teaching community can add their views and ideas to help manage any of the drawbacks or recommendations will be a good idea for example like you may have a lot of concerns with online learning, other teachers may have them but they have no specific place to go to give this ideas....

Interviewee: No, no .

Interviewer: So that was my sixth question actually my last I just wanted to know is there any information or suggestion or recommendation you can give to me because obviously I'm looking for that suggestion or recommendation from lectures experience how the technology can be better facilitated for the teaching staff, you going to say it support for the teaching staff as well, is there anything you can recommend for me?

Interviewee: Again I think what we need as teaching staff is more training...

Interviewer: More training.

Interviewee: Yes and more training is not really about the ICT, it's how to adapt our course material used for the classroom , virtual learning environment which sounds really easy but it's not always easy.

Interviewee: I lecture in health sciences.

Interviewer: Health sciences this is under what level?

Interviewee: This is under [third] level here.

Interviewer: Okay health sciences, how many years have you been lecturing?

Interviewee: just for a few years.

Interview with Dr K

Interviewed in Luton, date 15-01-2009

Interviewer: Basically my first question is, what kind of software technology do you use to teach?

Interviewee: Is photocopying being counted?mainly I use – I create my own material mainly from it, using it for lesson planned, using a computer. So I would use it in adapting lessons that are done, I would use it to create worksheets of students and I would use it sometime to get interesting items that we use from the internet and I will encourage my students to use it because I teach language and I teach, train, that's the main focus but I would encourage the students who are learning the language to create [consensus] situations by emailing each other, so I would use it in that sense for the students just saying why don't you for homework, instead of writing composition or whatever, email your student friends of yours or another student in the class.

So I would encourage the student to use this and I would also encourage them to use it for doing research on things that we've done in class but that could be a very simple level, something on global warming, have a look on the internet and find out what is said about it and read it up and depending on the level of students getting to use that they become independent learners because from a students point of view and from my teaching point of view, the main aim of my teaching is so that the students when they leave the course will know how to continue their learning and be independent learners.

From the language teacher point of view, that would mean then knowing how to view, see the website to find useful language teaching exercises. The BBC has excellent programs so I would recommend them in the language teaching situation to look at these news item that the BBC bring out on daily basis for foreign learners and I've adapted and simplified it. Those students will a get a chance to reinforce what we've done in the class or continue their learning and certainly have met some really excellent interactive materials there on the website that they can continue using. So I would point them towards those particular aspects. However as a teacher I don't use it as much as other people and I was reflecting on why I didn't, I think mainly because I'm of a generation we were better – at school were taught often in a very boring way, so you will find people in their 50s and 60 often, are very much more creative as teachers and anti the system.

I was reflecting on what I would say to you about that and I think from a psychological point of view there is a lot of creative teachers just feel that that inspiration you get when you are preparing a class which is based towards your students needs and bent towards your students learning style and making the language learning fun because I think people learn much, much better whether they are adults or kids if the language learning process is done through experience that

you can't get from a machine, if you would see what I mean, so therefore in my own teaching and presentation, I would do something which was experiential so that students can learn through discovering the language they need [even] be a game or good enough activity or situation, I use a lot of drama in my teaching so it wouldn't come through, you couldn't do that.

I think my own teaching style is one where I just feel as teacher every single class is different, every students needs are different and therefore to be an interesting teacher it's an interactive process, where your students needs vary so much say for example in one class, you could have quite sophisticated Polish students and maybe ladies that come from Pakistan or wherever, whose learning background is very different, therefore as a teacher you have to do a lot of preparation through each student in a way and I doubt a computer can do that.

Interviewer: What about – I've you heard of Web CT or Blackboard? Do you use that in your learning?

Interviewee: No I don't but the university does use it but I think this is partly my resistance towards it because I really do feel that they get far much more the class and they can use Blackboard but I don't myself know how to use it so well because I do more teacher training in teaching than my own.

Interviewer: That was the end of my first question, how much do you spend with technology for teaching, I mean how much time do you spend?

Interviewee: Inside my blog, quite a lot in preparation.

Interviewer: What about like your emails would you say hours, maybe a couple of hours in a week, maybe more than that, maybe eight hours or four hours, roughly?

Interviewee: I would say and I'm a part time teacher, let's say that for the sake of argument I would teach probably up to eight hours a week in total and I would probably generally speaking sometimes it's more but some eight hour input, I would probably use the computer for maybe six of those eight hours in preparation and that would mean looking at old lessons and creating worksheets for the students on the computer.

Interviewer: Do you feel that you spend too much time on this technology?

Interviewee: I think I do funny enough, that's a bit of a contradiction because I've just said that I don't much but I think I use it in a probably limited way, a very specific way for just really more as a type writer perhaps and then taking lessons that I've used before mixing them together. But I do quite a lot of time on that because I do create worksheets for each class more or less and that takes quite a long time to do. I would say I spend a lot of time on preparation and therefore use the computer for that.

Interviewer: You feel obviously the majority of your time that you spend more is on the term time or is in the holidays like where you should be now? Do you feel...

Interviewee: The work you mean? In term time, definitely.

Interviewer: And do you feel that carries on over the holidays as well?

Interviewee: I think during the holidays...

Interviewer: ...it reduces maybe.

Interviewee: Yes definitely, it will reduce. I wouldn't use it at all really but I might use it to email students for example.

Interviewer: Okay but what about this Blackboard and Web CT, do you feel that the university is compelling you to use them or trying to force you to use them?

Interviewee: Yeah and I resist it. I do, yes I do.

Interviewer: Since you have resisted, do you think that you quality of teaching – there is no effect having that technology that's why you resisted or you just...

Interviewee: I think because I have a resistance towards somebody telling me that I must do this, with a machine quite frankly, that's my resistance to it but I think it's probably positive in some way and probably negative in I do have to be realistic about technology and the fact that I think one needs to be aware of it but not what it was. I was again thinking about what I would say to you and I think my overall philosophy is you need to be the master of the machine not it master of you a bit worth. So you need to have mastery of it is rather like not being too dependent on it. It breaks down quite often, I've had very negative experiences when I'm teaching and in Adult Education, where we were forced to use something that didn't work half the time so I always, always have back up always and we use the Blackboard, I think we have something that we use, which everybody uses more or less in adult education, where you happen to bring in and you have the computer in the classroom.

Interviewer: All which are for you?

Interviewee: Yes but the OHPI use a lot, yes because I feel one happens to be in control of it [IB] a lecture can cause. I use the [OHP] a lot and transparency but you have much more control over that. So I think my resistance is that if it breaks down, I have to prepare two lessons because if this machine breaks down that is going to be used on the screen and having problems with it, what a waste of time when I also have this resistance towards the machine. That's it really.

Interviewer: Do you feel that the university or the institution they can actually do anything that will help you ease your resistance to it?

Interviewee: Yes and I think probably not forcing teachers to use it. You know not forcing you, I felt in the adult education, we were forced to use these things, you were forced to, how can I say, it wasn't only that it was also that we were forced to do a lot of paper work. Which I really – I have left adult education because of that, because I felt very strongly and I think this is possibly where my technological kind of resistance is, partly is that I felt very strongly that the institution will have an [initial] statement which sounds fantastic but in reality it doesn't take much notice of individual students very often. That's what I felt, I think it happening if you like it's not

partly related to this but I would guess it's happening on a much larger scale where we have a Labor Government in power that should be much kinder to the student in being sensitive the fact that you have a lot of different personalities in one class, your have people from different backgrounds in that class.

So as a teacher in order to teach effectively, you need to spend a lot of time encouraging some students and not be forced to do this huge amount of paper work and a lot of – you may have got your course on your technology and if you don't do it – my husband and I were both good teachers and we both left adult education because of this feeling – because of the more philosophical thinking but I think it come to human beings feeling that they have been completed like products and my philosophy is how – I feel that when a teacher or worker feels that the system is using him without realizing and taking from him, then he will not perform to the maximum. In the university we have a wonderful boss and we have the same kind of thinking.

As a leader he helps us to produce well, we don't feel that Ed is taking from us, we fell he is supportive and we are not forced to do things we don't want to do but I really feel very deeply that many teachers have been forced to because there is a huge amount of pressure including the technological bit, so the teaching vision, it can very easily become where we are forced to do things, it comes out of as something unfair because if they don't get funding everybody is going to loose the job. I think this is a less of other elements that are connected which people may not realize.

Interviewer: I think that actually answers the question quite well. I didn't expect the way you answered it well. Question number three, do you think your job role has changed and if changing often due to the technology that's coming out?

Interviewee: Yes I do. Very much so.

Interviewer: Since these changes have occurred, specifically the software type you know the Blackboard and Web CT, can you just briefly give me a couple of examples of the changes that you think you are [going].

Interviewee: The changes are – the positive once are but you need to have accessed, to or sent materials often and that's really, really positive. Positive aspect is that you have very good materials which has been prepared for students in a way that they can – very realistically that's really, really positive. That's the positive side that you can bring variety in class, you can – it all looks very nice as well.

Interviewer: And nice presentation?

Interviewee: And nice presentation is in song and a lot of students would expect that you can say as well, where you are looking at many students' expectations that they will expect a fancy presentation and all of that but and I said the negative side mainly is that you can't depend on it, you must have back up and that the teacher must not loose awareness of why he is there. As a human being you need to often prepare material either in OHT or for a handout which are more relevant to the student needs. Because of my own feeling is that when I face the students' needs, a lady in the classroom who might have come over here from a very simple background in

Bangladesh or wherever, her needs will be very, very different from the Polish student who wants to study at the university or he is quite sophisticated and I hadn't seen that the technology can cater for that. Do you see what I mean?

When you are teaching students especially adult students and you do need the analysis, perhaps one student is working in a care home, therefore part of your lesson will be created as you as teacher, for him to fill with the vocabulary he might need to work in a care home. The situation you might hear from the [student] who is working with the [speaker is sickly]. You see what I mean? The computer and the material we are talking about will give you an overall background if you like but the specifics need to be worked on by the teacher according to the individual student. Is that clear?

Interviewer: Yeah, I think that's a good point actually as well. Since this technology has come by, do you feel that you are doing more of these repetitive tasks? Or is there a repetitive task?

Interviewee: Yeah, no I think I do use the technology much, much more...

Interviewer: But you don't think is not much repetitive?

Interviewee: No, not me. I make sure that it doesn't happen.

Interviewer: Do you think in the technology, basically that's what the institutions are trying to force like Blackboard, Web CT do you think there is something or since you don't use it I should ask you, is there something that can be improved do you think that can entice you to that type of technology if it was there you would actually go...

Interviewee: I would need a very [IB] because of my own difficulty with technology and I know one of the men I work with, one of the other teachers, we both have – we are very creative people, we have a lot of difficulties, I think it's called Technophobia. [John] said it one day we are technophobic meaning that a lot of people actually lock off, it's like some people can't do mathematics but they are very good at other things and I think there should be a lot of, lot of support to help teachers with that difficulty. A lot of support from within the department and for the people to understand that there are people like myself who really need back up support from the directors or those – so that you maybe phone somebody and ask if there he can come and help you and actually support you in class. That's what I needed, isn't just need a workshop to show me how to use the technology, I needed somebody in the classroom with me to guide me through it and then I would have had less [IB], do you know what I mean?

Interviewer: Yes, yes, yes.

Interviewee: Almost like somebody coming to class for half an hour with me then I think I'd become more acquainted with it and I will be less [scared] of it.

Interviewer: I am just wandering for your specific course do you have a turf like a FAQ section in the websites for your school and FAQ, you know?

Interviewee: FAQ is?

Interviewer: Questions and Answers that they want to go out.

Interviewee: Okay yes.

Interviewer: For your particular course that you teach, is there anything or for yourself, like I mean for example but since you don't like technology the institution recognizes this, do they have some type of something in the website that's easily accessible to answer some of your questions, is there something?

Interviewee: No, not that I know of.

Interviewer: If you had to recommend something to the institution, will this be something that you think more…

Interviewee: I would recommend yes. I would recommend – maybe it's just me but more teachers have fought for people like my self and I think it's possibly very much a generational thing, people who have a resistance against technology. You may loose very good teachers because they feel everything is beyond them. With the kind of support that I am talking about, isn't enough for me just to see something on the workshop perhaps, I need to have that person that I said to you, to come into class with me and to really support me and I get used to the technology and then, I think I will be able to become more – consequently using it.

Interviewer: What happens – because institutions they are always funny about saving money, all they try to do is save money. What happens if they gave you a computer machine kind of in a classroom and you can ask a virtual assistance, do you think that you may just give it a try? It has got a face of a teacher or a man or a woman or so forth and it voice recognizes that if you ask question, do you think that – obviously you will be resistant but you may be tempted to ask…

Interviewee: But I may be tempted yes, yes, yes definitely.

Interviewer: Do you find that a lot of your students ask a lot of repetitive questions, same thing over and over again?

Interviewee: I think yes, definitely I do, yes I do very much particularly both in the teaching and the teacher training, always the same kind of questions, come up.

Interviewer: Alright, alright. Would you also feel that for example if there was a technology that can record your answer, that can send it to their emails, send it to their…

Interviewee: Yes, yes some of them yes, some of the questions yes but other questions that they ask no because for example in the teacher training, they learn by doing. A lot of the questions are I can't do this and I say, yes you can. Get up and do this, this and this there is a guide drawing them and perhaps teach your first lesson to your peers…

Interviewer: And right direction?

Interviewee: Yap so in that way though many of the same questions have come up but we teachers in training don't understand really what to do in order to make the

language learning easier or simple for the students. So if you are teaching grammar how to make that sound, I could use the technology just giving them ideas, emailing them and so on and I will often receive emails from teachers with a less incline on it and I reply and I will say very specifically, do this A, B do this, C do this, D do this and that will help some of the teachers but in the end it's actually them having this sometime inside them in the classroom getting them to do it. The machine can't do that and I think point you brought up about money, I don't think it's of interest but I think this is the whole crop of the problem is that materialism unfortunately is brought into the teaching ideal and it's really – I think that my connection is with materialism and technology I feel that you are getting away from the human being.

That's what I feel and I deeply feel that the mistake of adult education and education as a whole is money, money, money and our society as a whole, it has become quite a philosophical, spiritual if you question that people ask perhaps fear bound is a bit of an exaggeration but there is that element of fear of the system that if we don't do this, we'll use our jobs and this kind of thing and I really think that therefore you get a lot of people doing jobs that they don't want to do. So we understand [IB] so we are taking it to another level really. Being in a materialistic society which I'm really unpleased about [IB] at the moment because I think people will have to reduce materialism. That's my overall feeling about it but I think...

Interviewer: [IB] about it?

Interviewee: Yes I feel [awful] about it and a bit relevant to your questions at all.

Interviewer: It maybe actually, you've got some quite interesting points.

Interviewee: Yes I'd love if you could make it – put it in because I think when people feel that they are being used like machines in a way you wont get happy people, you wont get happy workers but if they feel that they are listened to and treated as human beings, with a boss or a leader who maybe quite tough with them sometimes but you will get – and a friend of mine has done a lot of very, very successful workshop on this, working with workers and [companies and so on] that a human being who feels that he is being taken care of and developed and grown will be much, much happier with less money than somebody who is just pressurized by an anonymous system and a anonymous government if you like.

I do feel that the crisis that we are going to go through difficult has it would be will have very, very positive results in a lot of cases in that human being I hope will learn to be more community and less materialistic because they have to be, do you see what I mean? They will have to share, they will have to cut down on a lot of these unnecessary technological things because they are not necessary and we therefore can concentrate more on, who is that student sitting opposite me as person rather than, I got to get through this because the system says so and that's really my feeling and I think that's a very philosophical point.

Interviewer: My fourth question is, is there any type of training you get on the online learning specifically?

Interviewee: Yes.

Interviewer: Do you get invited to them? Obviously you try to resist them but you always...

Interviewee: No, training for this kind of thing, for technology.

Interviewer: That's right.

Interviewee: Yes, that's probably is, we did a training – and again there are limitations to training but very often one is not allowed to experiment during the training so you might forget, it's a little bit like being told how to drive a car but until you actually drive it and you need your instructor next to you, as I said it can be quite frightening for some people.

Interviewer: Do you think that the technology is changing so often that you are always required to train again?

Interviewee: Yes, yes, yes I do.

Interviewer: You do in that?

Interviewee: Yeah I do.

Interviewer: Do you think that the training is effective or productive?.

Interviewee: I think it has to take place but maybe there are certain principles that one learns when training. Those are always there but there is this feeling of oh my goodness, I mean last year, I'll give you an example which may not be completely relevant but I felt given the cost consequence at the university, we all had computers which were fine, all of a sudden they disappeared and we got new computers. I lost all my material, the new computers, why did we get them when the university is struggling financially and we didn't need them?

There was again have that feeling of anonymity and the lack of cohesion between departments of what's going in so suddenly all the old computers are stuck up somewhere and we got new computers which keyboards don't work properly, we couldn't get them going so there was a lot of frustration in our department at that, we didn't want them. When we were on holiday this thing happened that just because I'm part time, my machine can disappeared and it's the Easter with a lot of materials that I still needed that was frustrating.

Interviewer: Do you think that you can recommend something that may help your training much more productive or make it easier? Is there something that you can recommend?

Interviewee: I think again probably seeing the relevance of it, perhaps seeing which elements of it are more successful than the one I'm using.

Interviewer: That's good, that's good.

Interviewee: I would need to be convinced which elements the students feel – I would be motivated if the students were to complain about who doesn't use enough technology in class.

Interviewer: [IB] that's a good one.

Interviewee: Yes, that would make me think, if I listen to what they say, oh my goodness me, wake up call [IB].

Interviewer: Can the institution help you in anyway in terms of regarding your training needs? Is there anything else that they can help you with?

Interviewee: Not really I think again as I said the training needs would be having the expert at hand when things go wrong and that doesn't happen very often. I'll give you an example, computers breakdown, it's really hard to get a hold of anybody and again you got this thing of voicemail, say there is some luck, it put's you up a lot. Do you see what I mean? Lack of that support that part of you knows that there is going to be another voice there saying, we are not at the office at the moment but please leave a message and will get back to you. And it's often quite complicated to get somebody to come and do something quite simple which I find quite a bit frustrating.

Interviewer: Do you [exercise] university website a lot?

Interviewee: Not a lot but I do use it definitely.

Interviewer: Can they put some training there in some just [the sections] that you really require maybe, I don't know if that can help?

Interviewee: Yes probably I think it would do. Maybe in our department for the head of department send us information about useful websites for something useful for it. I think probably his independent department that would happen more.

Interviewer: I think that answered that question quite well, that's [IB] one of them…

Interviewee: Yes good.

Interviewer: You will like this question, using technology does it cause you to become frustrated?

Interviewee: Yes.

Interviewer: Frustration, anger, resentment?

Interviewee: Yes, all of them.

Interviewer: All of them. Lack of interest?

Interviewee: Lack of interest, I'm a very, very patient person to take it over sometimes.

Interviewer: You don't get such as a lot of these depression or anxiety, do you get to that [IB]?

Interviewee: No I don't but I do get frustrated with it and I've seen, it's very frank it's very open, I think my frustration with the machines, it's been a joke in all my life quite frankly, I couldn't even use a sawing machine properly because I said I got a bit confused with it but yeah, I do it does really if I think about it. It makes me feel in a sense of a large part of my life is out of my control and I'll give you an example, I'm

relieved our computer, part of it the email facility got a virus and I'm quite relieved not to have it, I do feel this sense of oh my God, so it will often, I think you have to be really, really careful not to let it encroach on your life but you say I'm going to spend so much doing this as I'm still learning and perhaps learning to be patient with these things but I'm not going to let them dominate me.

Interviewer: Do you think it is basically affecting your motivation then?

Interviewee: Yes.

Interviewer: It is having a negative effect rather than…

Interviewee: I think well if I'm really honest I haven't thought about that but because I'm very careful to keep myself very motivated, I realize that I will often avoid these things because I find them time consuming and irritating when if I'm in control, I can do it better.

Interviewer: So you feel if the institution was trying to add more technology to somehow to ease, relieve your stress or anxiety you feel that may not work…

Interviewee: Not at all.

Interviewer: …you feel that will increase you…

Interviewee: Definitely not, it would increase it and I think it would [IB] a lot of people.

Interviewer: So basically it switched off your present and lack of interest basically not more technology but the technology.

Interviewee: More support yes and more relevant technology if I can see for example something comes up on that fantastic BBC website obviously it is great and I use that because I could see it's relevance to what I'm doing but to have to sit through workshop or learn things that are not relevant which you feel take a lot of control and responsibility out of your hands as a instructor or a lecturer, I do find out possibly 21st century syndrome which has a lot of positives but I really feel that there is something frightening, George [O'Reily] of machines taking over our lives.

Interviewer: This BBC website you are saying there is obviously I know the children learning part but…

Interviewee: Yes, it's on the world service, there is one called, I think it is called BBC [IB] it's a lovely, lovely website very useful and students can go on it and I do remember I should go back a little bit but we have to get our students at the adult education center to use computers for one hour or less learning time and we all find it so frustrating. If the machine doesn't work, so preparing our students to use was more trouble than it would were so we tended to give up on it.

Interviewer: On the website for BBC there are materials there, there is something there that they use very effective but it wasn't in your university's website or it wasn't there.

Interviewee: Yes that's right, yes, yes.

Interviewer: It's another question that you will probably not like and it's suggesting, basically you say things that you should not say when [my staff] suffering from lack of interest, resentment, depression perhaps they can add something that technology to relax or some videos, do you think that will be the type of things that will be helpful to you or do you think you'll get even more angrier?

Interviewee: I don't think I'll get more angrier, I think I wouldn't get angry if I could see the relevance to what I was doing. It's all basically that.

Interviewer: So much more communication everything that they do...

Interviewee: Much more, that's right, to say this is available...

Interviewer: This are the benefits for the...

Interviewee: ...this are the benefits for us and these are things you don't need to worry about [IB] that you'll find these very helpful because of A B C D. There was a BBC one, sorry now I just answered you question but one useful website not only for [school wise] which is a lovely one but also it's one BBC English I think 26 and it's a very good website where you might have the news, you know the latest news which is simplified for the learners use language development and that's lovely because it is really authentic.

Interviewer: The next question is – I was going to ask you the benefits of using the technology for your instructional purposes and the drawbacks but I think you've answered a lot of the benefits and the drawbacks but what I wanted to ask is that, is there anything in the technology that you can recommend that can manage some of the drawbacks like for example is there anything from your own experience that like for example you'd say back up tool you have to be cautious about that with some of the machines, is there anything something that you can think over the drawbacks or something that you can do to manage those drawbacks, is there something that I can do?

Interviewee: I'm thinking again just making sure that the right kind of support is there, that's what I really think understanding that some of us will withdraw even more if we feel there is pressure, pressure, pressure. So definite support and reliable human being support, I feel the same way when I turned up at the cinema the other day to get some information and there was a voice message thing that broke down half way through and then you have to phone a number to get information from and there are other 25 people waiting. I find that kind of frustration where you feel everything is getting out of our control in sense, we are getting dictated to by machines. That is my [IB].

Interviewer: One of the suggestions was to have a portal where all the higher education staff can voice their opinion on these things so that government can have access to it because there are so many things and the institution management can never [IB], do you think that maybe can be a good idea?

Interviewee: I do, I think that would be an excellent idea.

Interviewer: Because there are so many things out there but I think it's like there are so many voices there they don't know exactly where to go but you think [IB].

Interviewee: I think that would be fantastic because they would listen at the other end.

Interviewer: My last question is, okay it's not really a question do you think regarding this subject you may have any other recommendation, any other information or suggestion that you can give to me, to the institution or to the government.

Interviewee: I think to the government, to start with the government to have a real understanding of the dangers of technology, I think that's terribly, terribly important and it's time to really take that on board and say yes this is good but it doesn't have to dominate, to really listen to the teachers, to people like myself who have difficulty and there are a lot of us and I think particularly my generation, I think it's a tough generation to resist this, so many things in a sense and is government really listening and really, really providing realistic support and solutions so you don't feel it's [anonymous], another [anonymous] because in a sense again it gets perhaps philosophical things that all of us perhaps without realizing feel there is kind of anonymous machine taking our independence away from us and it takes things out of balance really but perhaps people within the schools who really do connect with the government, their local government level maybe, school level and then teachers level.

Basically the machines are used to enhance everybody they are not used to command everybody so as human beings to balance that technology we will listen to everybody and therefore it will be a much more creative step forward.

Interviewer: Okay I feel a certain question, how long have you been teaching if you don't mind me asking?

Interviewee: I don't know probably, I don't know very much for 40 years or that so.

Interviewer: 40 years?

Interviewer: But it's all been in the higher education mainly?

Interviewee: Higher education mainly and I used to do a lot of work for radio, educational radio and television and I worked in China quite a lot and have some [illustrious] training all over the world really and again I just talked about this before, I think it's really important for us as teachers it doesn't matter how long we've teaching but you must always be open to improving, learning and making yourself a more interesting educator.

Interviewer: So you are in the department of linguistics, specifically in English?

Interviewee: Yes, yes, yes, yes.

Interviewer: Do you teach undergraduate students or the more graduate students?

Interviewee: I do MA students, I teach MAs and I do a bit of a slot on their practical aspect of teaching and it is one thing to do on the BA course slot on teacher training but what at happens at the moment is that students leave the BA linguistic course and they were about teaching but when they come to a class where they don't know what to do all when they come to look for jobs they can't get none.

APPENDIX 5: Transaction logs

A sample of Blackboard transaction logs, one academic's log from Science and Technology and one from Health and Education department showing interactions and time of activity.

Subject	Academic	Module	Activity	Date and time
Science and Technology	Lecturer 16		Login	27/02/2014 11:15
Science and Technology	Lecturer 16	Module 23	View Section	27/02/2014 11:15
Science and Technology	Lecturer 16	Module 23	View	27/02/2014 11:15
Science and Technology	Lecturer 16	Module 23	View Section	27/02/2014 11:15
Science and Technology	Lecturer 16	Module 23	View Section	27/02/2014 11:15
Science and Technology	Lecturer 16	Module 23	View Section	27/02/2014 11:15
Science and Technology	Lecturer 16	Module 23	Add	27/02/2014 11:17
Science and Technology	Lecturer 16	Module 23	Add Mod Resource	27/02/2014 11:17
Science and Technology	Lecturer 16	Module 23	View Section	27/02/2014 11:17
Science and Technology	Lecturer 16	Module 23	Add	27/02/2014 11:46
Science and Technology	Lecturer 16	Module 23	Add Mod Resource	27/02/2014 11:46
Science and Technology	Lecturer 16	Module 23	View Section	27/02/2014 11:46
Science and Technology	Lecturer 16	Module 23	View Section	27/02/2014 11:46
Science and Technology	Lecturer 16	Module 23	View Section	27/02/2014 11:46
Science and Technology	Lecturer 16	Module 23	View Section	27/02/2014 11:46
Science and Technology	Lecturer 16	Module 23	View	27/02/2014 11:46
Science and Technology	Lecturer 16	Module 23	View	27/02/2014 11:46
Science and Technology	Lecturer 16	Module 23	View Section	27/02/2014 11:46
Science and Technology	Lecturer 17		Login	24/02/2014 09:46
Science and Technology	Lecturer 17	Module 4	View	24/02/2014 09:47
Science and Technology	Lecturer 17	Module 4	View	24/02/2014 09:47
Science and Technology	Lecturer 17	Module 4	View	24/02/2014 09:47
Science and Technology	Lecturer 17	Module 4	View Section	24/02/2014 09:47
Science and Technology	Lecturer 17	Module 4	Add Report Submission	24/02/2014 09:51
Science and Technology	Lecturer 17	Module 4	Add Turnitintool Assignment Created Report Submission	24/02/2014 09:51
Science and Technology	Lecturer 17	Module 4	Add Mod Turnitin Tool	24/02/2014 09:51
Science and Technology	Lecturer 17	Module 4	Add	24/02/2014 09:51
Science and Technology	Lecturer 17	Module 4	View Section	24/02/2014 09:51
Science and Technology	Lecturer 17	Module 4	Add Report Submission	24/02/2014 09:53
Science and Technology	Lecturer 17	Module 4	Update Turnitintool Assignment	24/02/2014 09:53

			Updated Report Submission	
Science and Technology	Lecturer 17	Module 4	Update Mod Turnitin Tool	24/02/2014 09:53
Science and Technology	Lecturer 17	Module 4	Update	24/02/2014 09:53
Science and Technology	Lecturer 17	Module 4	View Section	24/02/2014 09:53
Science and Technology	Lecturer 17	Module 4	View Section	24/02/2014 09:53
Science and Technology	Lecturer 17	Module 4	View	24/02/2014 09:53
Science and Technology	Lecturer 17	Module 4	Editsection	24/02/2014 09:53
Science and Technology	Lecturer 17	Module 4	View	24/02/2014 09:53
Science and Technology	Lecturer 17	Module 4	View Section	24/02/2014 09:54
Science and Technology	Lecturer 17	Module 4	View Section	24/02/2014 09:54
Science and Technology	Lecturer 17	Module 4	View Section	24/02/2014 09:54
Science and Technology	Lecturer 17	Module 4	View	24/02/2014 09:54
Science and Technology	Lecturer 17	Module 4	View	24/02/2014 09:56
Science and Technology	Lecturer 17	Module 4	View	24/02/2014 09:56
Science and Technology	Lecturer 17	Module 4	View Section	24/02/2014 09:56
Science and Technology	Lecturer 17	Module 4	View User Viewed Assignment	24/02/2014 09:56
Science and Technology	Lecturer 17	Module 4	View User Viewed Assignment	24/02/2014 09:56
Science and Technology	Lecturer 17	Module 4	Update Turnitintool Assignment Updated Report Submission	24/02/2014 09:57
Science and Technology	Lecturer 17	Module 4	Add Report Submission	24/02/2014 09:57
Science and Technology	Lecturer 17	Module 4	Update	24/02/2014 09:57
Science and Technology	Lecturer 17	Module 4	Update Mod Turnitin Tool	24/02/2014 09:57
Science and Technology	Lecturer 17	Module 4	View Section	24/02/2014 09:57
Science and Technology	Lecturer 17	Module 4	View Section	24/02/2014 09:57
Science and Technology	Lecturer 17	Module 4	View Section	24/02/2014 09:57
Science and Technology	Lecturer 17	Module 4	View User Viewed Assignment	24/02/2014 09:57
Science and Technology	Lecturer 17	Module 4	View User Viewed Assignment	24/02/2014 09:57
Science and Technology	Lecturer 17	Module 4	View User Viewed Assignment	24/02/2014 09:57
Science and Technology	Lecturer 17		Login	25/02/2014 11:09
Science and Technology	Lecturer 17	Module 4	View Section	25/02/2014 11:09
Science and Technology	Lecturer 17	Module 4	View	25/02/2014 11:09

Science and Technology	Lecturer 17	Module 4	View	25/02/2014 11:09
Science and Technology	Lecturer 17		Login	25/02/2014 13:44
Science and Technology	Lecturer 17	Module 5	View Section	25/02/2014 13:44
Science and Technology	Lecturer 17	Module 5	View	25/02/2014 13:44
Science and Technology	Lecturer 17	Module 5	View	25/02/2014 14:31
Science and Technology	Lecturer 17	Module 5	View	25/02/2014 14:34
Science and Technology	Lecturer 17		Login	26/02/2014 09:06
Science and Technology	Lecturer 17	Module 4	View	26/02/2014 09:06
Science and Technology	Lecturer 17	Module 4	View	26/02/2014 09:06
Science and Technology	Lecturer 17	Module 4	View	26/02/2014 09:41
Science and Technology	Lecturer 17	Module 4	View	26/02/2014 09:41
Science and Technology	Lecturer 17	Module 4	View	26/02/2014 09:42
Science and Technology	Lecturer 17	Module 4	View	26/02/2014 09:42
Science and Technology	Lecturer 17	Module 4	View	26/02/2014 09:42
Science and Technology	Lecturer 17	Module 4	View	26/02/2014 09:42
Science and Technology	Lecturer 17	Module 4	View	26/02/2014 09:46
Science and Technology	Lecturer 17	Module 4	View	26/02/2014 09:47
Science and Technology	Lecturer 17		Login	26/02/2014 11:15
Science and Technology	Lecturer 17	Module 5	View Section	26/02/2014 11:15
Science and Technology	Lecturer 17	Module 5	View	26/02/2014 11:16
Science and Technology	Lecturer 17	Module 5	View	26/02/2014 11:21
Science and Technology	Lecturer 17		Login	26/02/2014 11:37
Science and Technology	Lecturer 17	Module 5	View Section	26/02/2014 11:37
Science and Technology	Lecturer 17	Module 5	View	26/02/2014 11:37
Science and Technology	Lecturer 17	Module 5	View	26/02/2014 11:38
Science and Technology	Lecturer 17		Login	26/02/2014 12:35
Science and Technology	Lecturer 17	Module 4	View	26/02/2014 12:35
Science and Technology	Lecturer 17	Module 4	View	26/02/2014 12:35
Science and Technology	Lecturer 17		Login	26/02/2014 14:52
Science and Technology	Lecturer 17	Module 5	View Section	26/02/2014 14:52
Science and Technology	Lecturer 17	Module 5	View Section	26/02/2014 14:52

Health and Education	Lecturer 12		Login	23/02/2014 21:00
Health and Education	Lecturer 12	Module 35	View	23/02/2014 21:05
Health and Education	Lecturer 12	Module 35	View	23/02/2014 21:05
Health and Education	Lecturer 12	Module 35	View	23/02/2014 21:05
Health and Education	Lecturer 12	Module 35	View	23/02/2014 21:07
Health and Education	Lecturer 12	Module 35	Editsection	23/02/2014 21:07
Health and Education	Lecturer 12	Module 35	Add	23/02/2014 21:19
Health and Education	Lecturer 12	Module	Add Mod Book	23/02/2014 21:19

		35 Module		
Health and Education	Lecturer 12	35 Module	View	23/02/2014 21:19
Health and Education	Lecturer 12	35 Module	Add Chapter	23/02/2014 21:26
Health and Education	Lecturer 12	35 Module	Update Mod Book	23/02/2014 21:26
Health and Education	Lecturer 12	35 Module	View Chapter	23/02/2014 21:26
Health and Education	Lecturer 12	35 Module	Update Mod Book	23/02/2014 21:32
Health and Education	Lecturer 12	35 Module	View Chapter	23/02/2014 21:32
Health and Education	Lecturer 12	35 Module	Update Chapter	23/02/2014 21:32
Health and Education	Lecturer 12	35 Module	Update Chapter	23/02/2014 21:40
Health and Education	Lecturer 12	35 Module	Update Mod Book	23/02/2014 21:40
Health and Education	Lecturer 12	35 Module	View Chapter	23/02/2014 21:40
Health and Education	Lecturer 12	35 Module	View Section	23/02/2014 21:41
Health and Education	Lecturer 12	35 Module	View	23/02/2014 21:41
Health and Education	Lecturer 12	35 Module	View Chapter	23/02/2014 21:41
Health and Education	Lecturer 12	35 Module	Update Mod Book	23/02/2014 21:45
Health and Education	Lecturer 12	35 Module	Update Chapter	23/02/2014 21:45
Health and Education	Lecturer 12	35 Module	View Chapter	23/02/2014 21:45
Health and Education	Lecturer 12	35 Module	View Section	23/02/2014 21:45
Health and Education	Lecturer 12	35 Module	View	23/02/2014 21:45
Health and Education	Lecturer 12	35 Module	View Chapter	23/02/2014 21:45
Health and Education	Lecturer 12	35 Module	Update Mod Book	23/02/2014 21:47
Health and Education	Lecturer 12	35 Module	Update Chapter	23/02/2014 21:47
Health and Education	Lecturer 12	35 Module	View Chapter	23/02/2014 21:47
Health and Education	Lecturer 12	35 Module	Update Chapter	23/02/2014 21:51
Health and Education	Lecturer 12	35 Module	View Chapter	23/02/2014 21:51
Health and Education	Lecturer 12	35	Update Mod Book	23/02/2014 21:51

		Module		
Health and Education	Lecturer 12	35	View Section	23/02/2014 21:53
		Module		
Health and Education	Lecturer 12	35	View	23/02/2014 21:53
		Module		
Health and Education	Lecturer 12	35	Update Mod Book	23/02/2014 21:55
		Module		
Health and Education	Lecturer 12	35	Update	23/02/2014 21:55
		Module		
Health and Education	Lecturer 12	35	View	23/02/2014 21:55
		Module		
Health and Education	Lecturer 12	35	Add	23/02/2014 21:58
		Module		
Health and Education	Lecturer 12	35	Add Mod Book	23/02/2014 21:58
		Module		
Health and Education	Lecturer 12	35	View	23/02/2014 21:58
		Module		
Health and Education	Lecturer 12	35	Update Mod Book	23/02/2014 22:01
		Module		
Health and Education	Lecturer 12	35	Add Chapter	23/02/2014 22:01
		Module		
Health and Education	Lecturer 12	35	View Chapter	23/02/2014 22:01
		Module		
Health and Education	Lecturer 12	35	View Chapter	23/02/2014 22:23
		Module		
Health and Education	Lecturer 12	35	Update Chapter	23/02/2014 22:23
		Module		
Health and Education	Lecturer 12	35	Update Mod Book	23/02/2014 22:23
		Module		
Health and Education	Lecturer 12	35	View Section	23/02/2014 22:23
		Module		
Health and Education	Lecturer 12	35	Add	23/02/2014 22:25
		Module		
Health and Education	Lecturer 12	35	Add Mod Book	23/02/2014 22:25
		Module		
Health and Education	Lecturer 12	35	View Section	23/02/2014 22:25
		Module		
Health and Education	Lecturer 12	35	View Chapter	23/02/2014 22:27
		Module		
Health and Education	Lecturer 12	35	Update Mod Book	23/02/2014 22:27
		Module		
Health and Education	Lecturer 12	35	Add Chapter	23/02/2014 22:27
		Module		
Health and Education	Lecturer 12	35	View Section	23/02/2014 22:27
		Module		
Health and Education	Lecturer 12	35	Update Mod Book	23/02/2014 22:28
		Module		
Health and Education	Lecturer 12	35	Update	23/02/2014 22:28
		Module		
Health and Education	Lecturer 12	35	View Section	23/02/2014 22:28
Health and Education	Lecturer 12	Module	View Section	23/02/2014 22:28

		35 Module		
Health and Education	Lecturer 12	35 Module	Update	23/02/2014 22:28
Health and Education	Lecturer 12	35 Module	Update Mod Book	23/02/2014 22:28
Health and Education	Lecturer 12	35 Module	View	23/02/2014 22:28
Health and Education	Lecturer 12		Login	24/02/2014 10:04
Health and Education	Lecturer 12	35 Module	View	24/02/2014 10:04
Health and Education	Lecturer 12	35 Module	View	24/02/2014 10:51
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 10:52
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 10:52
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 10:52
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 10:52
Health and Education	Lecturer 12		Login	24/02/2014 10:54
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 10:54
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 10:54
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 10:54
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 10:55
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 10:56
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 10:56
Health and Education	Lecturer 12	35 Module	View All	24/02/2014 10:56
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 10:56
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 10:56
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 10:56
Health and Education	Lecturer 12	35 Module	Add	24/02/2014 10:57
Health and Education	Lecturer 12	35 Module	Update Turnitintool	24/02/2014 10:57
Health and Education	Lecturer 12	35 Module	Update	24/02/2014 10:57
Health and Education	Lecturer 12	35	Update Mod Turnitin Tool	24/02/2014 10:57
Health and Education	Lecturer 12	Module	View Section	24/02/2014 10:57

		35 Module	View User Viewed Assignment	24/02/2014 10:57
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 10:57
Health and Education	Lecturer 12		Login	24/02/2014 10:58
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 10:58
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 10:58
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 10:58
Health and Education	Lecturer 12		Login	24/02/2014 10:58
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 10:58
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 10:58
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 10:58
Health and Education	Lecturer 12	35 Module	Update Turnitintool	24/02/2014 10:59
Health and Education	Lecturer 12	35 Module	Add	24/02/2014 10:59
Health and Education	Lecturer 12	35 Module	Update	24/02/2014 10:59
Health and Education	Lecturer 12	35 Module	Update Mod Turnitin Tool	24/02/2014 10:59
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 10:59
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 10:59
Health and Education	Lecturer 12		Login	24/02/2014 10:59
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 11:00
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 11:00
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 11:00
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 11:00
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 11:00
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 11:00
Health and Education	Lecturer 12	35 Module	Edit	24/02/2014 11:00
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 11:00
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	24/02/2014 11:00

Health and Education	Lecturer 12	Module	Login	24/02/2014 11:01
Health and Education	Lecturer 12	35 Module	View Section View User Viewed	24/02/2014 11:01
Health and Education	Lecturer 12	35 Module	Assignment View User Viewed	24/02/2014 11:01
Health and Education	Lecturer 12	35 Module	Assignment	24/02/2014 11:01
Health and Education	Lecturer 12	35 Module	View View User Viewed	24/02/2014 11:01
Health and Education	Lecturer 12	35	Assignment	24/02/2014 11:01
Health and Education	Lecturer 12	Module	Login	24/02/2014 11:35
Health and Education	Lecturer 12	35	View Section	24/02/2014 11:35
Health and Education	Lecturer 12	Module	Login	24/02/2014 13:53
Health and Education	Lecturer 12	35 Module	View Section View User Viewed	24/02/2014 13:53
Health and Education	Lecturer 12	35 Module	Assignment View User Viewed	24/02/2014 13:53
Health and Education	Lecturer 12	35 Module	Assignment	24/02/2014 13:53
Health and Education	Lecturer 12	35 Module	Edit View User Viewed	24/02/2014 13:53
Health and Education	Lecturer 12	35 Module	Assignment View User Viewed	24/02/2014 13:53
Health and Education	Lecturer 12	35 Module	Assignment	24/02/2014 13:53
Health and Education	Lecturer 12	35 Module	View Section	24/02/2014 13:56
Health and Education	Lecturer 12	35	View	24/02/2014 13:56
Health and Education	Lecturer 12	Module	Login	24/02/2014 14:52
Health and Education	Lecturer 12	35	View	24/02/2014 14:52
Health and Education	Lecturer 12	Module	Login	25/02/2014 09:58
Health and Education	Lecturer 12	35	View	25/02/2014 09:58
Health and Education	Lecturer 12	Module	Login	25/02/2014 14:06
Health and Education	Lecturer 12	35	View	25/02/2014 14:07
Health and Education	Lecturer 12	Module	Login	25/02/2014 14:42
Health and Education	Lecturer 12	35 Module	View	25/02/2014 14:42
Health and Education	Lecturer 12	35 Module	View	25/02/2014 14:42
Health and Education	Lecturer 12	35 Module	Start	25/02/2014 14:42
Health and Education	Lecturer 12	35	View	25/02/2014 14:42
Health and Education	Lecturer 12	Module	View	25/02/2014 14:43

		35		
Health and Education	Lecturer 12		Login	26/02/2014 12:04
		Module		
Health and Education	Lecturer 12	60	View	26/02/2014 12:04
		Module		
Health and Education	Lecturer 12	60	View	26/02/2014 12:04
Health and Education	Lecturer 12		Login	27/02/2014 10:22
		Module		
Health and Education	Lecturer 12	35	View	27/02/2014 10:22
		Module		
Health and Education	Lecturer 12	35	View Section	27/02/2014 10:22
		Module		
Health and Education	Lecturer 12	35	View Section	27/02/2014 10:23
		Module		
Health and Education	Lecturer 12	35	View	27/02/2014 10:23
		Module		
Health and Education	Lecturer 12	35	View	27/02/2014 10:24
		Module		
Health and Education	Lecturer 12	35	View Chapter	27/02/2014 10:24
		Module		
Health and Education	Lecturer 12	35	View Section	27/02/2014 10:24
		Module		
Health and Education	Lecturer 12	35	View Section	27/02/2014 10:24
		Module		
Health and Education	Lecturer 12	35	View Section	27/02/2014 10:24
		Module		
Health and Education	Lecturer 12	35	Update	27/02/2014 10:24
		Module		
Health and Education	Lecturer 12	35	Update Mod Book	27/02/2014 10:24
		Module		
Health and Education	Lecturer 12	35	View Section	27/02/2014 10:24
		Module		
Health and Education	Lecturer 12	35	View Section	27/02/2014 10:33
		Module		
Health and Education	Lecturer 12	35	View	27/02/2014 10:33
		Module		
Health and Education	Lecturer 12	35	View Section	27/02/2014 10:33
		Module	View User Viewed	
Health and Education	Lecturer 12	35	Assignment	27/02/2014 10:33
		Module	View User Viewed	
Health and Education	Lecturer 12	35	Assignment	27/02/2014 10:33
		Module	View User Viewed	
Health and Education	Lecturer 12	35	Assignment	27/02/2014 10:33
		Module		
Health and Education	Lecturer 12	35	View Section	27/02/2014 10:39
		Module	View User Viewed	
Health and Education	Lecturer 12	35	Assignment	27/02/2014 10:40
		Module	View User Viewed	
Health and Education	Lecturer 12	35	Assignment	27/02/2014 10:40
Health and Education	Lecturer 12	Module	View User Viewed	27/02/2014 10:40

		35 Module	Assignment	
Health and Education	Lecturer 12	35 Module	View Section	27/02/2014 11:04
Health and Education	Lecturer 12	35 Module	View	27/02/2014 11:05
Health and Education	Lecturer 12	35 Module	View	27/02/2014 11:07
Health and Education	Lecturer 12	35 Module	View Chapter	27/02/2014 11:07
Health and Education	Lecturer 12	35 Module	View Section	27/02/2014 11:08
Health and Education	Lecturer 12	35 Module	View	27/02/2014 11:08
Health and Education	Lecturer 12	35 Module	View Chapter	27/02/2014 11:08
Health and Education	Lecturer 12	35 Module	View Section	27/02/2014 11:40
Health and Education	Lecturer 12	35 Module	View	27/02/2014 11:40
Health and Education	Lecturer 12	35 Module	View Section	27/02/2014 11:40
Health and Education	Lecturer 12	35 Module	View	27/02/2014 11:40
Health and Education	Lecturer 12	35 Module	View	27/02/2014 11:41
Health and Education	Lecturer 12	35 Module	Editsection	27/02/2014 11:41
Health and Education	Lecturer 12	35 Module	View	27/02/2014 11:41
Health and Education	Lecturer 12	35 Module	View Section	27/02/2014 11:42
Health and Education	Lecturer 12	35 Module	View	27/02/2014 11:42
Health and Education	Lecturer 12	35 Module	View	27/02/2014 11:42
Health and Education	Lecturer 12	35 Module	Editsection	27/02/2014 11:43
Health and Education	Lecturer 12	35 Module	View	27/02/2014 11:43
Health and Education	Lecturer 12	35 Module	View	27/02/2014 11:44
Health and Education	Lecturer 12	35 Module	Editsection	27/02/2014 11:44
Health and Education	Lecturer 12	35 Module	Update Mod Book	27/02/2014 11:51
Health and Education	Lecturer 12	35 Module	Update	27/02/2014 11:51
Health and Education	Lecturer 12	35 Module	View	27/02/2014 11:51
Health and Education	Lecturer 12	35	Update	27/02/2014 11:52

Health and Education	Lecturer 12	Module 35	Update Mod Book	27/02/2014 11:52
Health and Education	Lecturer 12	Module 35	View	27/02/2014 11:52
Health and Education	Lecturer 12	Module 35	Update	27/02/2014 11:53
Health and Education	Lecturer 12	Module 35	Update Mod Book	27/02/2014 11:53
Health and Education	Lecturer 12	Module 35	View	27/02/2014 11:53
Health and Education	Lecturer 12	Module 35	Editsection	27/02/2014 11:54
Health and Education	Lecturer 12	Module 35	View	27/02/2014 11:54
Health and Education	Lecturer 12		Login	27/02/2014 15:32
Health and Education	Lecturer 12	Module 36	View Section	27/02/2014 15:32
Health and Education	Lecturer 12	Module 36	View User Viewed Assignment	27/02/2014 15:32
Health and Education	Lecturer 12	Module 36	View User Viewed Assignment	27/02/2014 15:33
Health and Education	Lecturer 12	Module 36	View User Viewed Assignment	27/02/2014 15:33
Health and Education	Lecturer 12		Login	28/02/2014 09:10
Health and Education	Lecturer 12	Module 35	View	28/02/2014 09:10
Health and Education	Lecturer 12	Module 36	View Section	28/02/2014 09:10
Health and Education	Lecturer 12	Module 36	View User Viewed Assignment	28/02/2014 09:10
Health and Education	Lecturer 12	Module 36	View User Viewed Assignment	28/02/2014 09:10
Health and Education	Lecturer 12	Module 36	View User Viewed Assignment	28/02/2014 09:10
Health and Education	Lecturer 12		Login	28/02/2014 09:16
Health and Education	Lecturer 12	Module 35	View	28/02/2014 09:22
Health and Education	Lecturer 12	Module 35	View Section	28/02/2014 09:27
Health and Education	Lecturer 12	Module 35	View User Viewed Assignment	28/02/2014 09:28
Health and Education	Lecturer 12	Module 36	View Section	28/02/2014 09:30
Health and Education	Lecturer 12	Module 36	View User Viewed Assignment	28/02/2014 09:31
Health and Education	Lecturer 12	Module 36	View User Viewed Assignment	28/02/2014 09:31
Health and Education	Lecturer 12	36	Assignment	28/02/2014 09:31
Health and Education	Lecturer 12	Module	View Section	28/02/2014 09:37

		35 Module		
Health and Education	Lecturer 12	35 Module	View Section	28/02/2014 09:37
Health and Education	Lecturer 12	35 Module	View Section	28/02/2014 09:37
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	28/02/2014 09:38
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	28/02/2014 09:38
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	28/02/2014 09:38
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	28/02/2014 10:30
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	28/02/2014 10:30
Health and Education	Lecturer 12	35 Module	Assignment	28/02/2014 10:31
Health and Education	Lecturer 12	35 Module	View All	28/02/2014 10:31
Health and Education	Lecturer 12	35 Module	View Section	28/02/2014 10:31
Health and Education	Lecturer 12		Login	28/02/2014 12:53
Health and Education	Lecturer 12	35 Module	View Section	28/02/2014 12:53
Health and Education	Lecturer 12	35 Module	View Section	28/02/2014 12:54
Health and Education	Lecturer 12	35 Module	View Section	28/02/2014 12:54
Health and Education	Lecturer 12	35 Module	Add Update Turnitintool	28/02/2014 12:54
Health and Education	Lecturer 12	35 Module	Assignment Updated	28/02/2014 12:54
Health and Education	Lecturer 12	35 Module	Update Mod Turnitin Tool	28/02/2014 12:54
Health and Education	Lecturer 12	35 Module	Update	28/02/2014 12:54
Health and Education	Lecturer 12	35 Module	View Section	28/02/2014 12:54
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	28/02/2014 12:54
Health and Education	Lecturer 12		Login	28/02/2014 13:42
Health and Education	Lecturer 12	35 Module	View Section	28/02/2014 13:42
Health and Education	Lecturer 12	35 Module	View All	28/02/2014 14:20
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	28/02/2014 14:20
Health and Education	Lecturer 12	35	Assignment	28/02/2014 14:21
Health and Education	Lecturer 12	Module	View User Viewed	28/02/2014 14:21

		35 Module	Assignment	
Health and Education	Lecturer 12	35 Module	View All	28/02/2014 14:21
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	28/02/2014 14:22
Health and Education	Lecturer 12	35 Module	View User Viewed Assignment	28/02/2014 14:22
Health and Education	Lecturer 12	35	View User Viewed Assignment	28/02/2014 14:22
Health and Education	Lecturer 12		Login	28/02/2014 14:45
Health and Education	Lecturer 12	35 Module	View Section	28/02/2014 14:46
Health and Education	Lecturer 12	35 Module	View	28/02/2014 14:46
Health and Education	Lecturer 12	35 Module	View Section	28/02/2014 14:46
Health and Education	Lecturer 12	35 Module	View Chapter	28/02/2014 14:46
Health and Education	Lecturer 12	35 Module	View	28/02/2014 14:46
Health and Education	Lecturer 12	35	View Section	28/02/2014 15:05

APPENDIX 6: Identifying themes

Steps of analysis

This appendix shows how the interviews data was coded, discovered themes and analysed.
Brawn and Clarke (2006) six steps in Thematic Analysis was used, following list five of the six steps followed to find and code themes. The sixth step is the report writing and presenting the findings.

1. Reviewing and transcribe the data

This step detail how the data was collected, any notes taken and transcription detail.

All interviews were tape recorded and then transcribed for analysis. For each interview, the recording was listened to and notes made on important points relevant to the research.

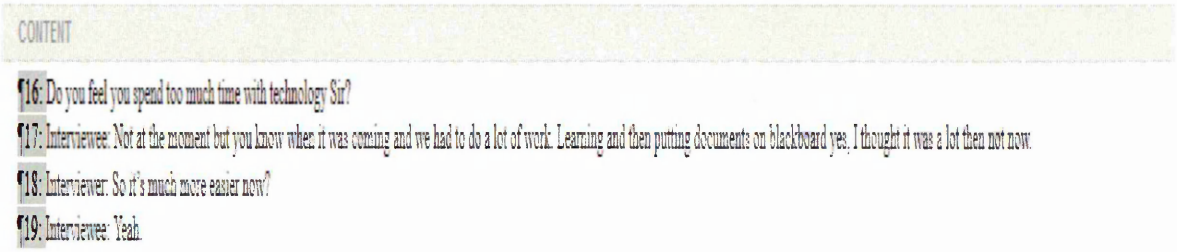
During the interviews important information was noted down immediately. The field notes were useful, as they served as quick immediate analysis after the interview was over, and helped to identify the key points and similar patterns across all the interviews. This step involved the process of reading data and transcribing to become familiar with the data.

2. Identify codes

After getting familiar with the data, the next step was to list what is of interest in the data and produce initial codes. This involved focusing on the core data by filtering it, and numbering and coding the data to make it easy to understand and compare.

Texts of interest was highlighted and descriptive words or short sentences was used as a code. Within this stage, I coded as many potential patterns and data of interest. The text in the raw data highlighted with a descriptive word which can serve as the code; this demonstrates the coding process and that it is genuine and valid.

Example of text of interest was identified:


CONTENT

¶16: Do you feel you spend too much time with technology Sir?

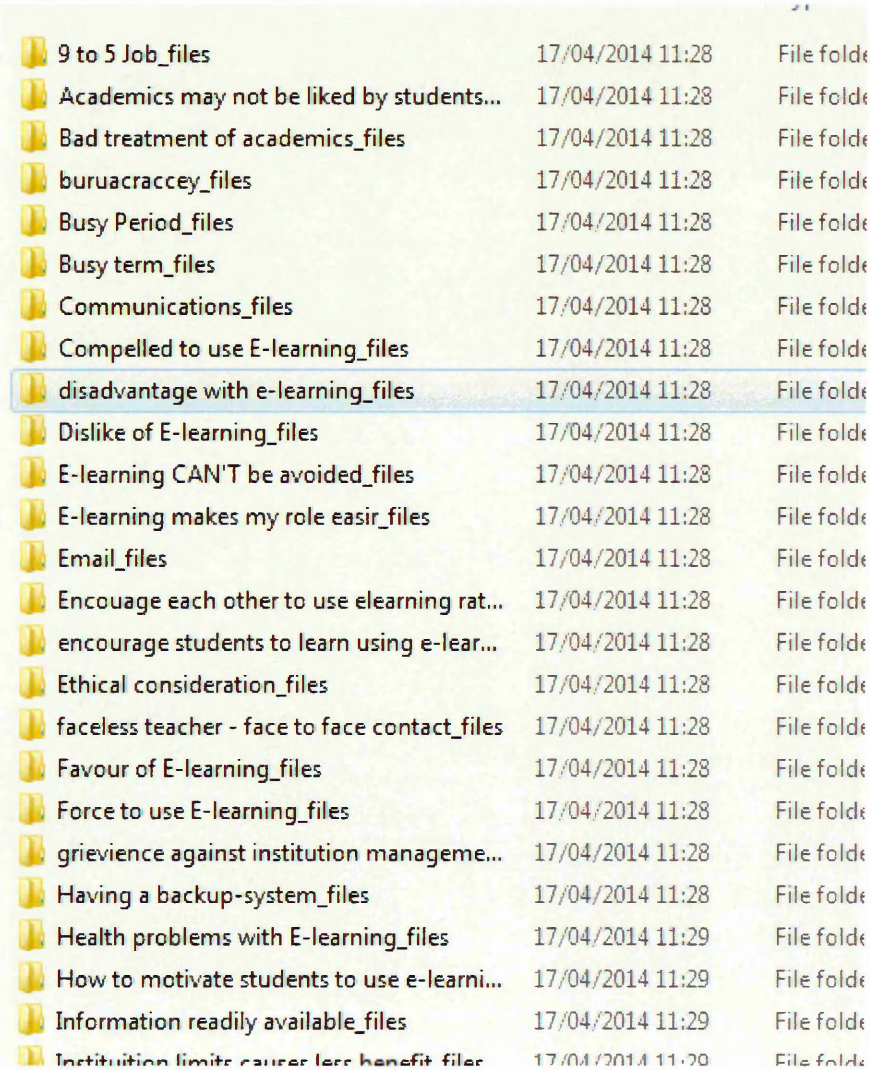
¶17: Interviewee: Not at the moment but you know when it was coming and we had to do a lot of work. Learning and then putting documents on blackboard yes. I thought it was a lot then not now.

¶18: Interviewer: So it's much more easier now?

¶19: Interviewee: Yeah.

COVERAGE	CONTENT
1.36 %	¶93: fifth question is, using technology does it cause you to become frustrated? ¶94: Interviewee: Never. ¶95: Interviewer: Never. It's more affecting your teaching ability or your motivation with? ¶96: Interviewee: In fact in a positive way.
1.06 %	¶99: frustration comes in when then, the system are not working but I must say that during the last at least last tl

The text of interest were linked to themes, a folder was created in NVIVO, as listed below



Below is a table with the name of code that refers to a particular pattern of text based on the pattern and data collection of this study. This helps to answer the research question, aims and objectives. Column 1 is the number assigned to the code,

column two is the name of the code and column three indicate how many times this category has been referred to by interviewees.

Table lists of Initial Codes

Number	Name of code	References
1	9 to 5 Job	4
2	Academics may not be liked by students	1
3	Bad treatment of academics	1
4	Bureaucracy	2
5	Busy Period	3
6	Busy term	4
7	Communications	6
8	Compelled to use e-learning	4
9	Complex e-learning	1
10	Disadvantage with e-learning	15
11	Dislike of e-learning	4
13	e-learning makes my role easier	2
14	Email	1
14	Encourage each other to use e-learning rather than force	1
16	Encourage students to learn using e-learning	1
17	Ethical consideration	1
18	Faceless teacher	3
19	Favour of e-learning	12
20	Force to use e-learning	5
21	Grievance against institution management	1
22	Having a backup-system	2
23	Health problems with e-learning	20
24	How to motivate students to use e-learning	3
25	Information readily available	1
27	Is it worth the Price students pay	1
28	Job role changes	5
29	Job role has not changed	2
30	Job role is getting easier	2
31	Learning style and e-learning	3
32	Limited by specification	1
38	Number of hours spent on e-learning	9
49	Ramifications of e-learning	7
40	Recommendations	55
41	Repetitive less or more	3
42	Resistance to e-learning	3
43	Resource support	9
44	Role changing	13
46	Student to encouraged to use e-learning	2
47	Students can encourage academics use e-	2

	learning	
48	Technical problems with e-learning	4
49	Technical support	3

3. Searching for themes

This step involves searching for themes of interest especially a theme or a pattern that will help answer a research question or meet the stated objectives. It is important to categorise the themes in a broader definition as it will help to unearth implicit relations between codes.

Table showing broader themes that emerged till no other themes were found

Code name	Broader themes, category of academic perspective
9 to 5 Job Busy Period No Time for academics to fully use e-learning Number of hours spent on e-learning Uses of e-learning	Longer working hours
Dislike of e-learning e-learning CAN'T be avoided Force to use e-learning	Disadvantage
e-learning makes my role easier Email communication Information readily available	Advantage
Self learning Modern day students with Cyberculture Values	Role Change
Minimum training received	Training required

Grievance against institution management Compelled to use e-learning Complexity with e-learning Technical problems with e-learning	Frustration

4. Reviewing themes

Having categorised the codes into broader categories in the previous step, this step involved revisiting the aims and objective to identify themes which are adding value to the research question and removing those that did not bear contribution to the investigation.

For this step, the focus is on the many challenges faced by academics in the context of the research aims and objectives.

5. Defining and naming the themes

In this stage, refined the themes to show what is interesting about the themes that relate to the research. Once the themes have been categorised at the most abstract level, the codes then reflect the answer to the research question.
An example:

Theme A: Tool for a job

This theme shows academics are not concerned about the type of technology that they use, rather they want something that works to do their job.

Theme B: Advantage and Disadvantage of e-learning technology

This theme is to show what academics consider to consider the benefits of e-learning technology and the drawbacks.

Theme C: Longer working hours

This theme is to show academics are spending increased amount of time using the e-learning system. Quotes from academics:

> *"20 hours plus a week"*, Iterview Dr G. Tha

APPENDIX 7: Wish list

Academics suggested 30 ways their situation can be improved:

Human support category

1. Making sure the right kind of support is available.

Managing expectations category

2. To manage expectations of academics and students.
3. Managing student support.

Organisational variations category

4. Managing variations and change effectively.

Feedback category

5. Feedback should occur more promptly.

Specialist support category

6. Academics should not update blackboard, technical specialist to support academics.

Standardising technology category

7. Usage of other e-learning tools creates extra workload.

Student monitoring category

8. Student monitoring system should be included in e-learning environment.

Usability category

9. Assessment should be improved and included in e-learning.
10. Always complement learning with Video feed.
11. The e-learning platform online help should be made easier to understand.
12. Create GUI standard and standardise the operational functions.
13. The interface can be more usable, more intelligent.

Dynamic system category

14. E-learning system should automatically create relevant citation/links to articles and books.

Infrastructure category

15. To have a resilient network infrastructure.

Visual communications category

16. Lecturers use SKYPE to communicate with colleagues.

Training support category

17. More training is required for mature lecturers.
18. Training should be during working hours.

Individual needs category

19. The e-learning system does not cater for foreign student needs.

Health hazard category

20. Awareness of health hazards.

Flexibility category

21. E-learning systems at present are not flexible.

Pedagogical category

22. Lecturers to increase motivation aspects in teaching in e-learning environment.
23. Social Networking aspects should be included in e-learning.

Editing category

24. The Edit facility is lacking in Blackboard.

Interactive whiteboard category

25. Interactive whiteboard to be used with Blackboard.

Authority category

26. Blackboard does not have control, authority of lecturers in the discussion rooms.

Miscellaneous category

27. Removing the mouse and the keyboard which can save time and operating effort.
28. Institutions to allow lecturers use open source software.
29. Make Blackboard similar to BBC Learning.
30. The e-learning system is not required, traditional system is sufficient.

APPENDIX 8: Patent search

Searches were conducted of the following United States Patent Office, UK Patent Office and European patent web sites.

Some of the searched key words:

Academic requesting content

Academic requesting materials

Academic content request

Content search

Bidding for content

Supply content

An example of how USPTO patent search were carried out.

First step went to the following search link:
http://www.uspto.gov/patents/process/search/

Parameters were inserted in term and field:

Term 1: Academic requesting content

Term 2: Academic requesting material

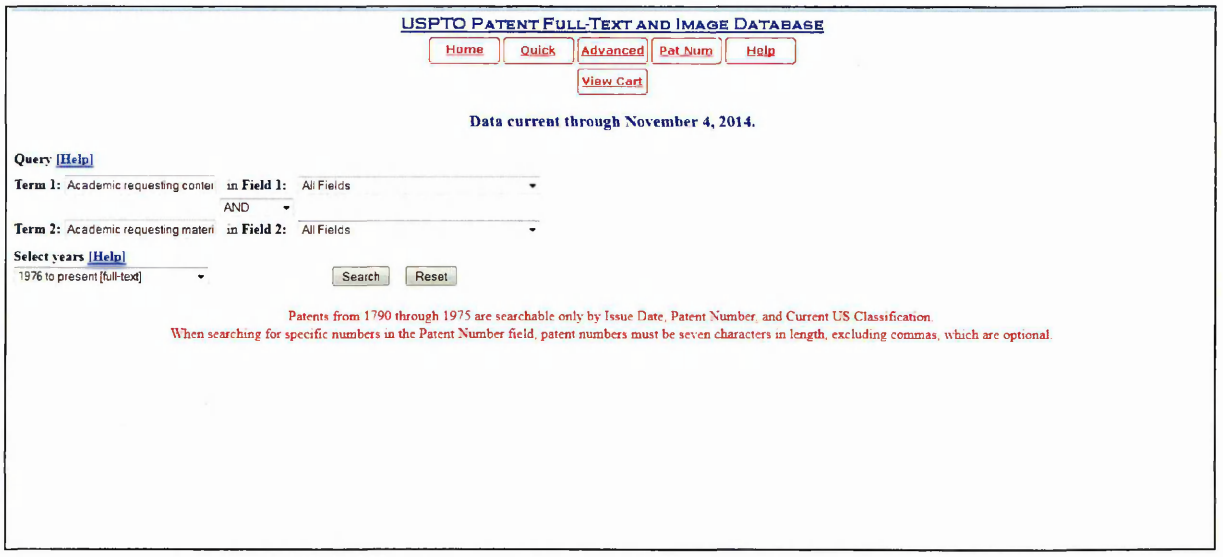
Select years: 1976 to present

Field 1: All Fields AND

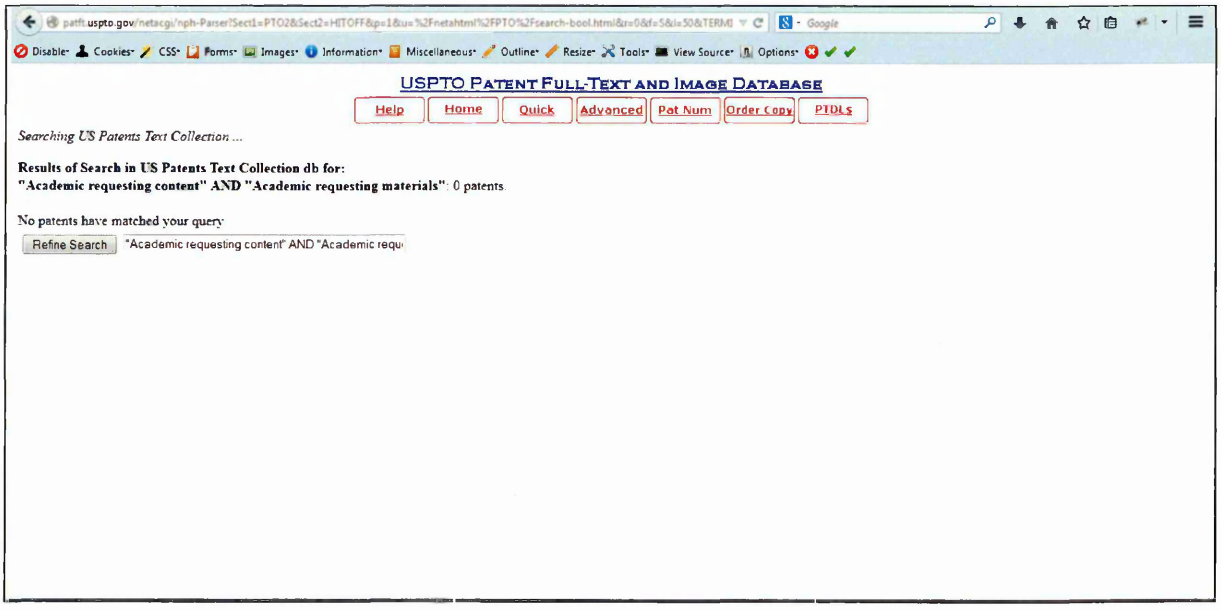
Field 2: All Fields

The first screen output shows how parameter was inserted and second screenshot shows the rest of the search.

USPTO first screenshot of showing parameters entered:



Second screenshot showing the USPTO search did not display any similar patents as shown below.



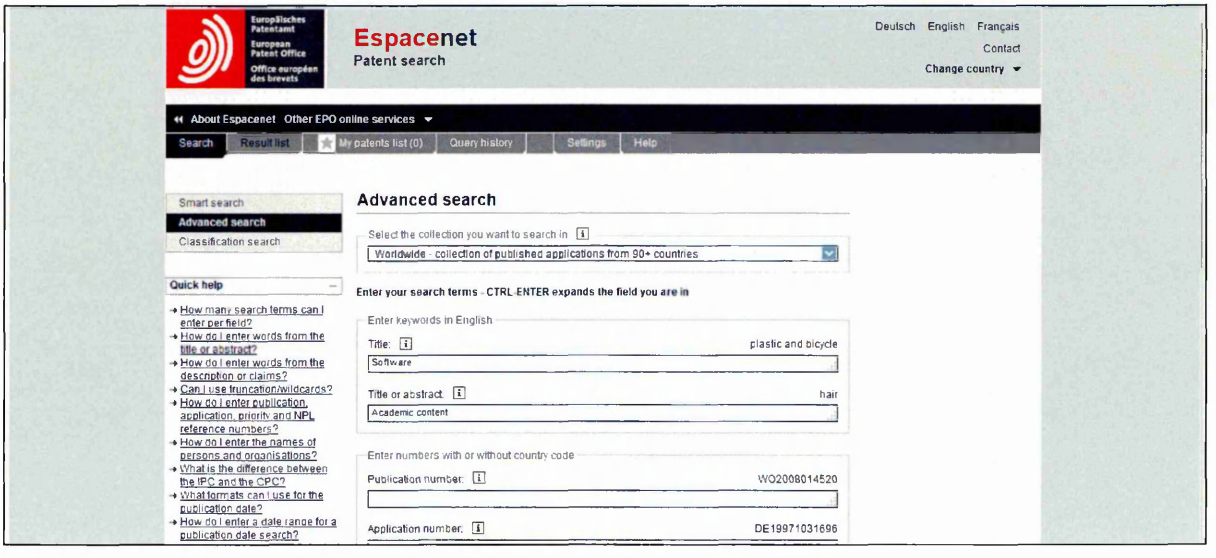
Many other searches were carries out and using the search terms listed in section 5.2, an example below of search 'Academic content' shows results **but nothing close** to software for academic requesting content and materials:

Search from Espacenet

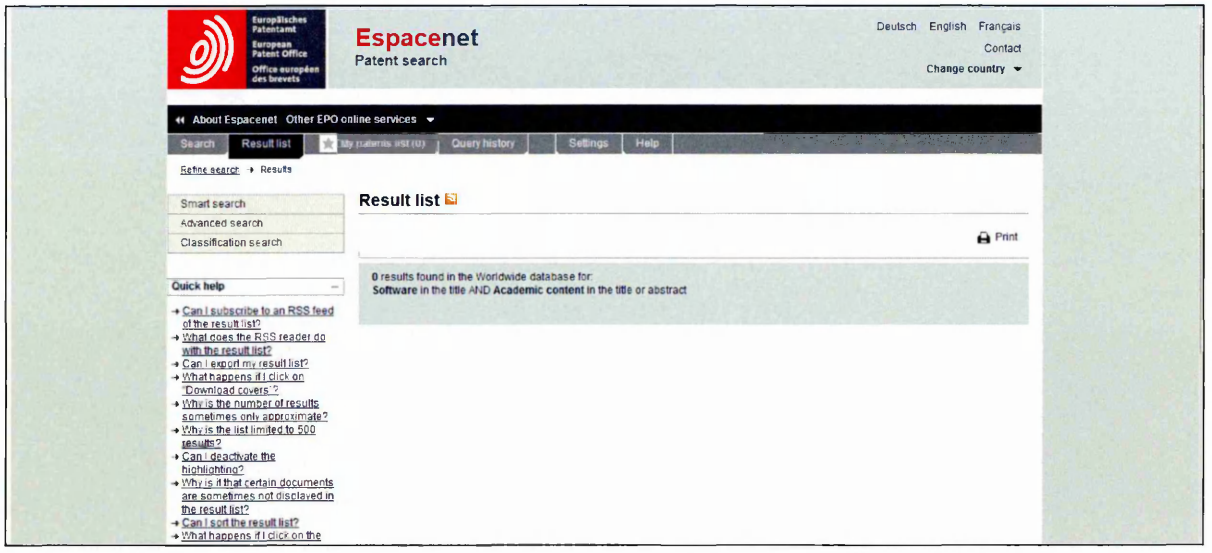
Espacenet contains over 80 million patent documents worldwide about inventions and technical developments from 1836. Knowledge-Base Forum concept was searched using terms described in section 5.2, an example shown below.

Website: http://worldwide.espacenet.com/advancedSearch?locale=en_EP

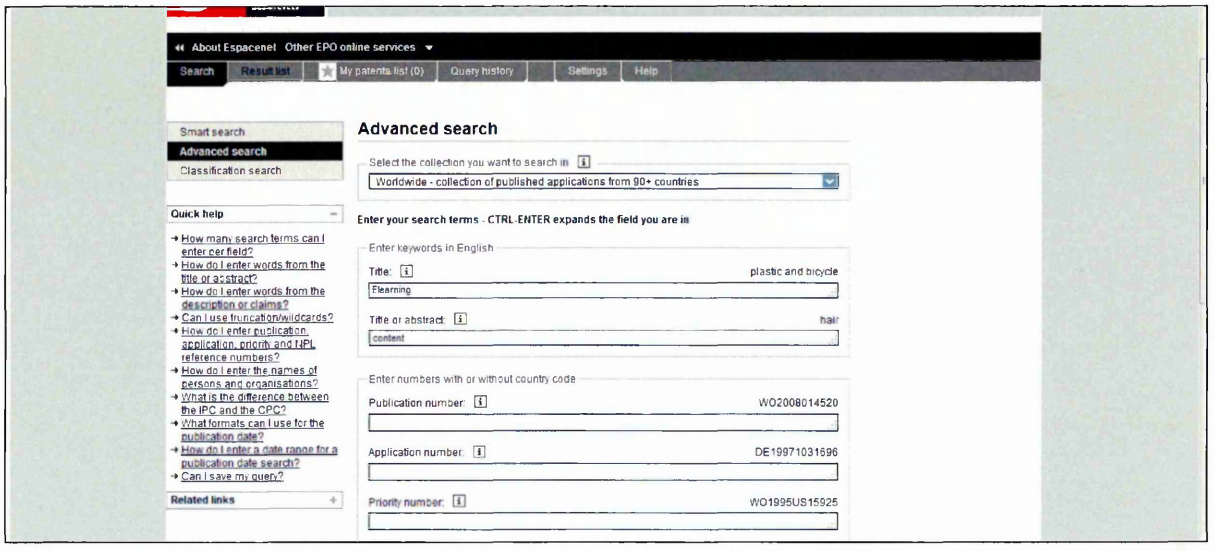
Keywords were entered in the 'Title' box and 'Title or Abstract', 'Software' and 'academic content' were inserted as shown below:



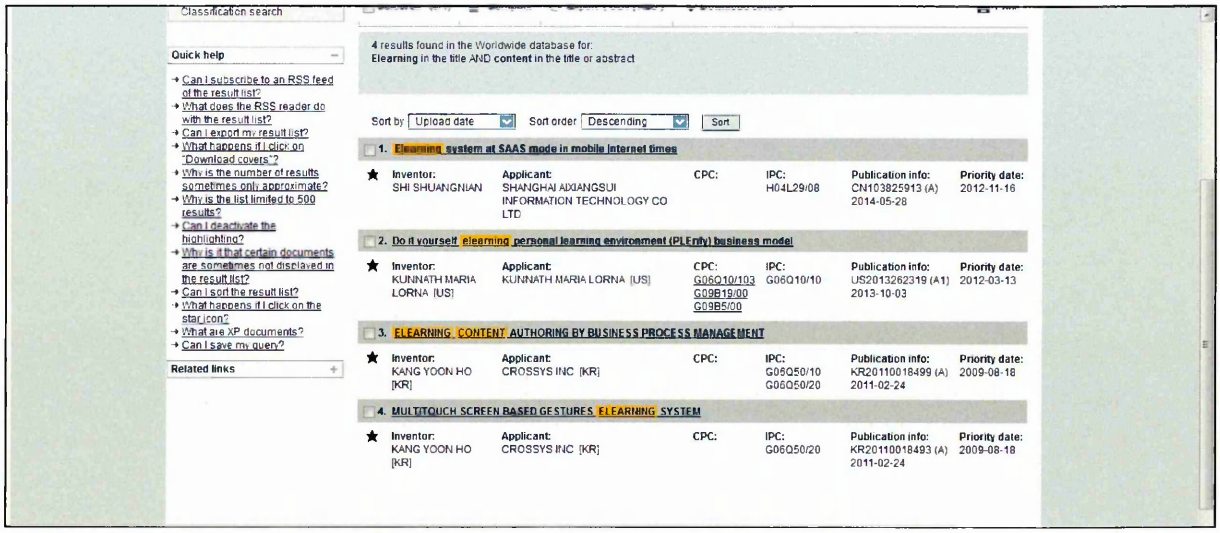
The result did not produce any results as shown:



Other key words were entered as below and some produced results:



Some key words that produced result were not similar to Knowledge-Base Forum. Below is an example showing key words producing results but does not match Knowledge-Base Forum.

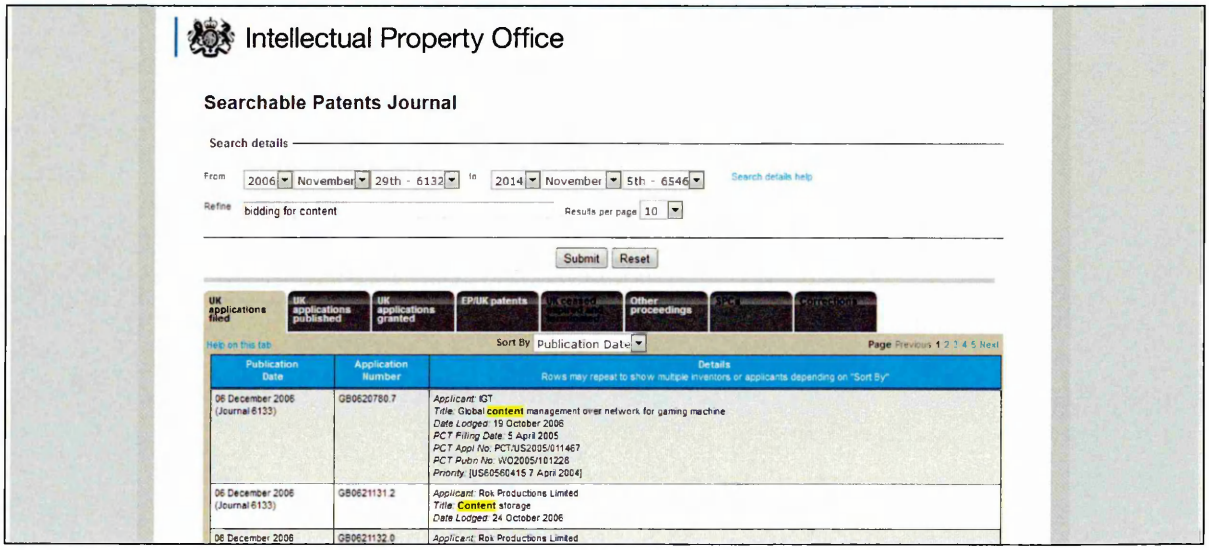


Search from Intellectual Property Office

The UK Intellectual Property Office holds online patents journal, applications filed, published and granted. Also contains Europeans patents that were applied in UK and patents that have ceased and expired from 2006 onwards.

Website: http://www.ipo.gov.uk/types/patent/p-os/p-journal/p-pj

Keywords were entered in the refine box: 'bidding', 'software', 'academic content' and other key words mentioned in section 5.2; however results produced nothing similar Knowledge-Base Forum. An example shown below:



APPENDIX 9: Second phase interviews

This appendix contains two samples of the second phase interviews, the interviews were conducted after the trial of the prototype.

Post prototype interview with Dr BB

Date 28-07-2011

Interviewee: If you can find a way that someone can write content for us, that maybe a good approach, you need some lecture notes, hope you know that. You design something and finally you lose content, it says [???] [0:01:21] maybe that way you can handle it. So like for people of this idea and that I wanted to show you what it is. Basically what it is, is that it's an application role, you go to a particular website and you say, as a lecturer you come in and you say... sorry, first you log in and let me just log in.

[OFF MIC CONVERSATION]

Person: It... that it's quite [???] [0:02:01] you just go through, let the...

[OFF MIC CONVERSATION]

Interviewee: It's the minute of [???] [0:02:23]. I'm a lecturer, lecturer and I need content on English grammar [???] [0:02:40]. For whatever or presentation. Only, but need to act like, let the staple, can you describe what it is and what you do with the instrument? Somebody, now this application will have a publisher that will have a history. So with some publishers, the way you motivate them is because they write lots of content, so if they write content where you... their logo and update, so it's beneficial for them to do it. So you know, so they go here, they do like that, I'm a lecturer, I need some content in English grammar for my students. It's okay, I'll only read more on this, I'm a content writer, so I think I'm an expert in grammar, I can help. Basically what's happening it's bidding just opened. So the publisher, basically writes what you need, I'm a lecturer and I need some content, you can just come up with material, that's what you said. There's one guy who's an expert, he said I'm an expert, I can help, and I'm an expert. I can help as well, whatever they said.

Interviewer: Yes, now normally what they would do they would put a CV or the credential.

Interviewee: The credentials, yes.

Interviewer: Then you have an option, but will look for. I like this guy, I don't like this guy.

Interviewee: Right.

Interviewer: So you can him, or I like him he's got the expertise, so I will approve him.

Interviewee: Right.

Interviewer: A message will go to the expert to and he would be told, I will write the content and it will be till you pop up here saying this thing, is rather grammar like that you doing for your tutorials for your student.

Interviewee: Right.

Interviewer: It's a very simple software, you just probably need five minutes tutorial.

Interviewee: Yes.

Interviewee: It saves you time from writing the content.

Interviewer: Right.

Interviewee: The second thing is that you are resetting your properties.

Interviewer: Yes.

Interviewee: So you go to the library or, use the system I need references, experts say, I know about this I can help you. At the end of the day is to bring you some information to you, without you having all, without you having to actually go and search for it. Maybe you've got some article and you need some feedback from other lecturers. But Instead of going back on all these... going after them, if they looked, I've got an article, you as experts what do you think about it, give me some feedback.

Interviewer: Right.

Interviewer: You can, maybe when you are writing a book, you say that I've written this far, I need help with the rest. Is there anyone who is an expert who can say yes? You can use that for very...

Interviewee: Nobody will waste your time. So that I mean it seems very useful because, sometimes you are surfing the internet, and it get one connected to another connection. And you can get the information on that happens today.

Interviewer: That's right. So yeah, [???] [0:09:37]

Interviewer: So basically you think this is something could be of help you as a lecturer?

Interviewee: Yeah definitely especially people use like doing research. I think it seems like ideal because you could get to the expert and you know

and it won't waste your time basically. So that's yeah I can see that being very, very useful for doing research yeah.

Interviewer: What do you think, do you think it's, is it very complex to use do you think?

Interviewee: I mean I'm not very good at computers but I think it is very simple, I can get used to this.

Interviewee: Right, you are in control.

Interviewee: I mean the other day I was looking for some information about the difference between Chinese law and British law, legal differences but you may have to write exactly on it and it was so difficult if anything that this definition is like. You write a huge, long legal document or something like that it will take you hours to read through and for instance you want, there's no need to [???] [0:14:46] for the information. And that's very difficult that first chart which will be one way around that I think.

Interviewer: So basically Chinese legal law and you are trying to do some research and that reading the whole documentation, you will require something smaller.

Interviewee: Yes. . I need a snippet of information you know

Interviewer: Do you think you may require a vast amount of training to know this systems?

Interviewee: I mean I can pick up very quickly actually even me...

Interviewer: So it's quite easy for you?

Interviewee: I think. Look, yes.

Interviewer: Could it be a useful tool for communication?

Interviewee: Oh definitely yeah. You are preparing to communicate your needs in that way. Yeah.

Interviewer: Okay I think that is very good. Do you think if you found it beneficial everything you recommend to your friend the import?

Interviewee: Absolutely, yeah. Definitely because if I could use it ... I will ask my colleagues too.

Interviewer: Excellent, no problem. Okay, not a problem. I recorded some of your suggestions

Interviewer: Thank you very much.

Interviewee: My pleasure.

[0:19:34] [RECORDING STOPPED] [026]

Second phase – post prototype interview with Dr. AK

Date 31 Aug11

Interviewer: This is confidential so anything that you say is confidential just to use in my own research. what do you think about this form idea of you creating requests and somebody fulfilling that...?

Interviewee: Yeah I think it's a very nice idea, very good idea because, academic will have a particular objective of wanting to become a member of a professional academic organization. So with this particular network... I can see that network in the sense that when people require to get free information and they think you have the expertise or you belong to that, you can easily and we do that. So I think it's a very good idea that if I got money we can develop into a bigger project.

Interviewer: Do you actually like the functionality like you request something, you click here it goes to end user another academic user, anything in functionality that you dislike or like or is it quite easy for you to use...?

Interviewee: I think with this obviously new things have their own attendance problem. I mean...its obviously to me I think its brilliant having to think of wanting a piece of academic information and then clicking it goes to another person and...its certainly... that is if it works well. It depends on the group of academic coming into the system. Some are certainly very easy to respond to. But we have people who are always eager, even their own personal publication, they want to put it up for others to benefit. So if the right people are within it, they are certainly going to be beneficial even though you can't just say it's absolutely beneficial. It might have its short comings where you send in information...you request for information, it doesn't come or the wrong information comes...and all that.

Interviewer: Do you feel that this application or this forum may help you reduce your time in any way as an academic obviously, your time is precious this may either help you...?

Interviewee: Yes and no, because sometimes it depends on... like I mentioned earlier on, once you drop it in there and it comes in good time. Obviously it's going to save time and even cost. It saves time and cost because once you send it and another colleague actually responds. Not just giving you the answer but also making you aware of specific places you can go for that information. So sometimes it's not just giving you the content but giving you ideas about where to find the information which will certainly reduce the cost or the time you will have used to search here and there somehow just giving you a way. Others giving you the content or...

Interviewer: Right, so this system allows you to request for content but would you be happy to add another functionality requesting content just say if you know where I can this information that maybe helpful?

Interviewee: Yeah, that would certainly be good.

Interviewer: This may happen with your colleague once you've made a request it may happen that another colleague may come and give you a line where this information is. So that may help.

Interviewee: Yes.

Interviewer: Okay, that's good.

Interviewee: And also, just to add that, you are not getting it from one place. Several people can give you information so that...not just from that person. You look at getting a wide range of information about that which is s.

Interviewer: Do you think it's quite easy to use system?

Interviewee: Yeah, I tried that. When we tried that I saw that it was quite easy.

Interviewer: Do you feel that this may help you in your communication processes as a [quality] to another academic in [case of...?]?

Interviewee: Yeah, because obviously we have existing system with you, you see that point?

Interviewer: Yes.

Interviewee: Sometimes times you just call someone so it all depends and it depends on everyone. Every academic has, it is sort of tends he or she wants or associations or sort of software's you want to assign yourself to. So yes obviously once I do it and takes on. I'll be happy to use that to my main source of communication as well as getting information.

Interviewer: Would you as an overall would you find this as a beneficial application that you may recommend to your other academic colleagues, obviously its beneficial...?

Interviewee: Yeah... no obviously that's what we normally do. You go in to for example, there's this academia and its sort of web environment where academics actually go in to get members and all that. So when you get that you share that with your colleagues. You only need to invite them in and that's it so this particular... we didn't actually talk about that. So if you have a particular norm where can invite you need that process to invite other people to come.

Interviewer: So you can...?

Interviewee: So that if you are a member if you are actually log on to this software you should be able to send emails to other people to invite then in so that they become members.

Interviewer: So there is proper networking.

Interviewee: Proper networking and so on.

Interviewer: That's a good idea. Do you feel that this forum like is like is just another... another technology on top of many technologies that it bothers you, and annoys you that...

Interviewee: No, no, no, not annoying because anybody who speaks knowledge will certainly will not underrate anything. Even though there are similar environment in use now. So it all depends on... because I've just looked at it.

Interviewer: That's right.

Interviewee: So for now my response can just be very limited from what... I think realistically it is going to be very beneficial. But it depends on going in to it using it and so on. What innovative ideas come and...

Interviewer: The last question I interviewed another academic a while ago and he was not very interested in the application he just said well why as an academia, why do I want to help someone else with knowledge. There is no beneficial sense to me I mean and I got a bit stunned but...

Interviewee: I think like I mentioned something a bit and this gives me an opportunity to elaborate on what I wanted to speak. Every academic has a level... some people do not accomplish at all. They just limit themselves to their teaching and that's it. We have academics who teach as well as get involved in professional development activities and all that, very proactive. If you meet anyone of them you will certainly be excited about the responses they will give to you. So I mean it's likely that you will meet academics who have nothing I mean they don't even want to engage. So you, he or she doesn't see why you should get involved in that. It needs a bit of... to become a proper academic you need another step. You go beyond your job description; I mean that's the reality, you just have to go a step beyond what you required to do to get engaged with others.

Interviewer: Do you think that in our system is it something you can think of where I can put as an incentive so people like those other academics who don't really want to engage other than if they see a benefit is there something I can maybe... something you can...?

Interviewee: You can only... what's happening is that you might want to understand why they are getting a number of them to just... some people don't just like it. Some people are anti technology, let me [???] [0:09:29] this, so no matter in academic have their own brain no matter what you do, you won't get them on board. But there are some people because they have not actually seen the real benefits or haven't been... so those you

can entice them by just identifying a particular academic organization. Not virtual remember not virtual. In a department for example you can just come and make a presentation, demonstrate once in a meeting because we have people who come to academic meetings or you just in particular department you know when they have their academic meetings. You can just talk to the chair, the chair will be happy to give you 10 minutes or 15 minutes. We have people for example if I have a new idea or you can even pass it through an academic or there is this particular software which I think if we use it as a team is going to be very beneficial. Then you introduce it just see how it will create exciting things or examples and off we go. I've seen people...yeah. That's just one way you can get... entice people to get involved.

Middlesex University document describing why the migration to Moodle from Blackboard

Project background

It has been 12 years since Oasisplus was first introduced and despite changes in learning, teaching, and assessment practices Oasisplus has changed little in that time and is beginning to show its age. As a result its core tool set has been supplemented by other institutional and external tools to add value, functionality and flexibility to meet the needs of our diverse learning and teaching community.

Blackboard, the providers of Oasisplus, have informed us that the version we currently use at Middlesex (Blackboard Vista) will no longer be supported as of January 2013 and that should we wish to remain with Blackboard we would be required to move to an entirely new product.

Although Oasisplus will continue to be supported internally by the Educational Development Unit (EDU) within the Centre for Learning and Teaching Enhancement (CLTE) and CCSS, considering the above and the findings of the scoping exercise carried out over the last 18 months we have taken the important decision to move away from Blackboard to the open source platform Moodle as our replacement for Oasisplus.

Scoping

The decision to move to Moodle has not been taken lightly and was the result of extensive research and evaluation undertaken over the last 18 months, which engaged stakeholders from across the University.

Scoping activities included:

- Future VLE scoping report whereby the internal needs of academics were gathered in addition to scoping the systems used within other academic communities/HEI (DVC's Academic Group 10th January 2012) (appendix 1)
- Future learning technologies blog
- Staff Interviews
- Future learning technologies staff questionnaire
- Staff open briefing and feedback sessions
- Staff focus groups
- E-assessment project

The scoping exercise highlighted important overarching principles that were considered when choosing Moodle as the replacement for Oasisplus. These include the requirements that pedagogical considerations are of prime importance and that the selected platform must:

- Be flexible and facilitate multiple pedagogical models, modes of delivery, assessment strategies, and support a wide range of learning styles
- Contain a variety of assessment, community building communication, collaboration and content delivery tools
- Provide a secure, supported and safe environment for academic colleagues to develop digital literacys and their use of educational technologies to meet requirements of current and future University wide initiatives such as e-assessment , programme based assessment and the development of more flexible learning opportunities such as online distance education
- Integrate with current university systems in particular MISIS, myUniHub and Talis Aspire (New library reading list software) and be flexible enough to accommodate future developments and systems
- Be flexible and adaptable to meet the fast pace of change in educational technology and future trends
- Be user friendly, with an intuitive interface and work flows that support users in their various roles

What is Moodle?

Moodle is an open source learning, teaching and assessment platform. Open source means it is not owned and developed by a single company, such as Blackboard, but instead by a community of educators who contribute and collaborate in its development.

Moodle has grown in popularity over the last five years and is increasingly used in tertiary, further and higher education institutions across the UK, so we are not alone in considering Moodle the best way forward.

Some of the UK higher education institutions using Moodle are:

- Brunel
- University College London (UCL)
- University of Bath
- University of Glasgow
- Goldsmiths
- University of London
- Open University UK
- Royal Holloway
- City University
-

Why Moodle?

A review of the virtual learning environment (VLE) market was undertake as part of the scoping exercise, which identified possible options for the replacement of Oasisplus. It was apparent that all the main providers in the market shared similar tools so in moving to Moodle we will not be losing functionality but will benefit from some of the unique characteristics of Moodle.

- Moodle was the only tool that provided all the functionality with no extra license cost
- Open source architecture provides us with the flexibility to develop the system and meet the changing needs of the institution
- Moodle has a large and active development community that the institution can benefit from and contribute to
- Moodle has no licence restriction and would therefore allow more flexibility for greater collaborative use of the VLE with external partners, delivery of CPD and open access programmes of study that may sit outside the University's academic structures.

APPENDIX 11: Configuring Drupal 7

Drupal is a free, open source software package that allows an individual to configure, manage and publish content, having any number of customisation. The customisation can take the form of coding using PHP scripting language, mySql database query language or configuration changes. Open source allows anyone to download the source code or feature and customise it according to their needs without authorisation or licence fee.

Drupal is developed by a community of users and developers. Anyone is free to download and share it with others. This open development model allows people to contribute to the building and success of the software. Drupla community members are constantly working to make sure Drupal supports the latest technologies that the web offers. The Drupal project fundamentally supports modularity, collaboration and ease-of-use. Since Drupal is designed and built by community of users in a modular fashion therefore new modules can be added to do a specific function without compromising the architecture of Drupal.

Drupal is one of the most popular open source software and many public and private institutions have used Drupal to build their web interface, few notable web sites are WhiteHouse.Gov and Stanford University.

The configuration of Knowledge-Base Forum using Drupal consists of flags, views, taxonomy and the content or node pages.

Knowledge-Base Forum was designed and configured from scratch. The module objects required are Private comments, Views, Five Star, Profile, Flag and Voting to enable the Knowledge-Base functionality.

Configuration was undertaken according to the requirement and framework set in section 5 of this thesis. The module objects are contribution from drupal community and they can be found at:

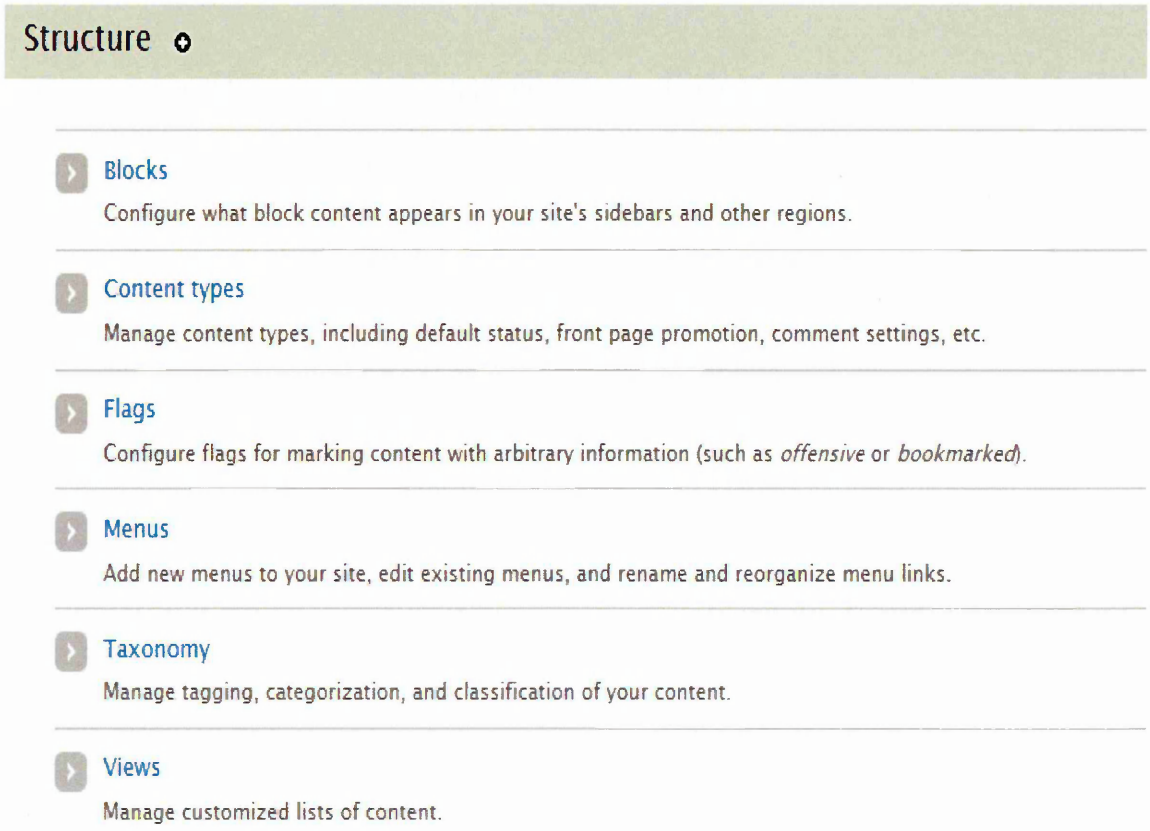
https://drupal.org/project/modules

http://drupaldeveloper.in/codelet/drupal-crowdsource-features

Following shows how the prototype was developed:

Before any logic applied or programming done the forms has to be designed. Drupal allows forms to be created, database views to be inserted, and definitions of names created for the purposes of categorisation.

The 'Structure' screenshot shows the Drupal development options, this is done by clicking Structure > Content type.



First the forms were created.

Drupal allows forms creation by clicking Content Types, to fine forms.

Academic request form: this allows the academic to describe their request for content,

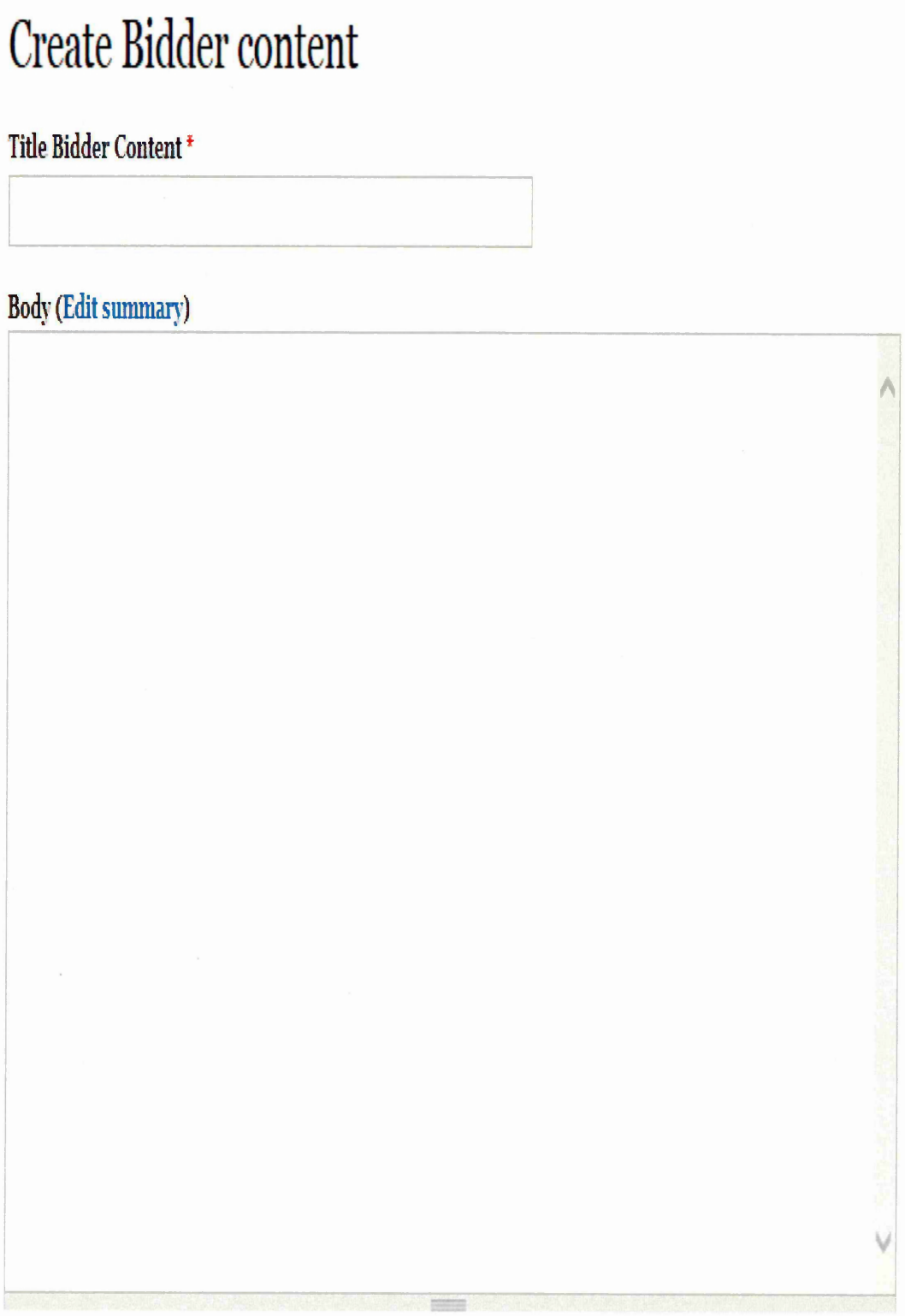
The Knowledge Base Forum consists of two main forms:

1. Request Content : This form allows the academic to request content
2. Bidder Content: This form contains all the database views of bids made by bidders

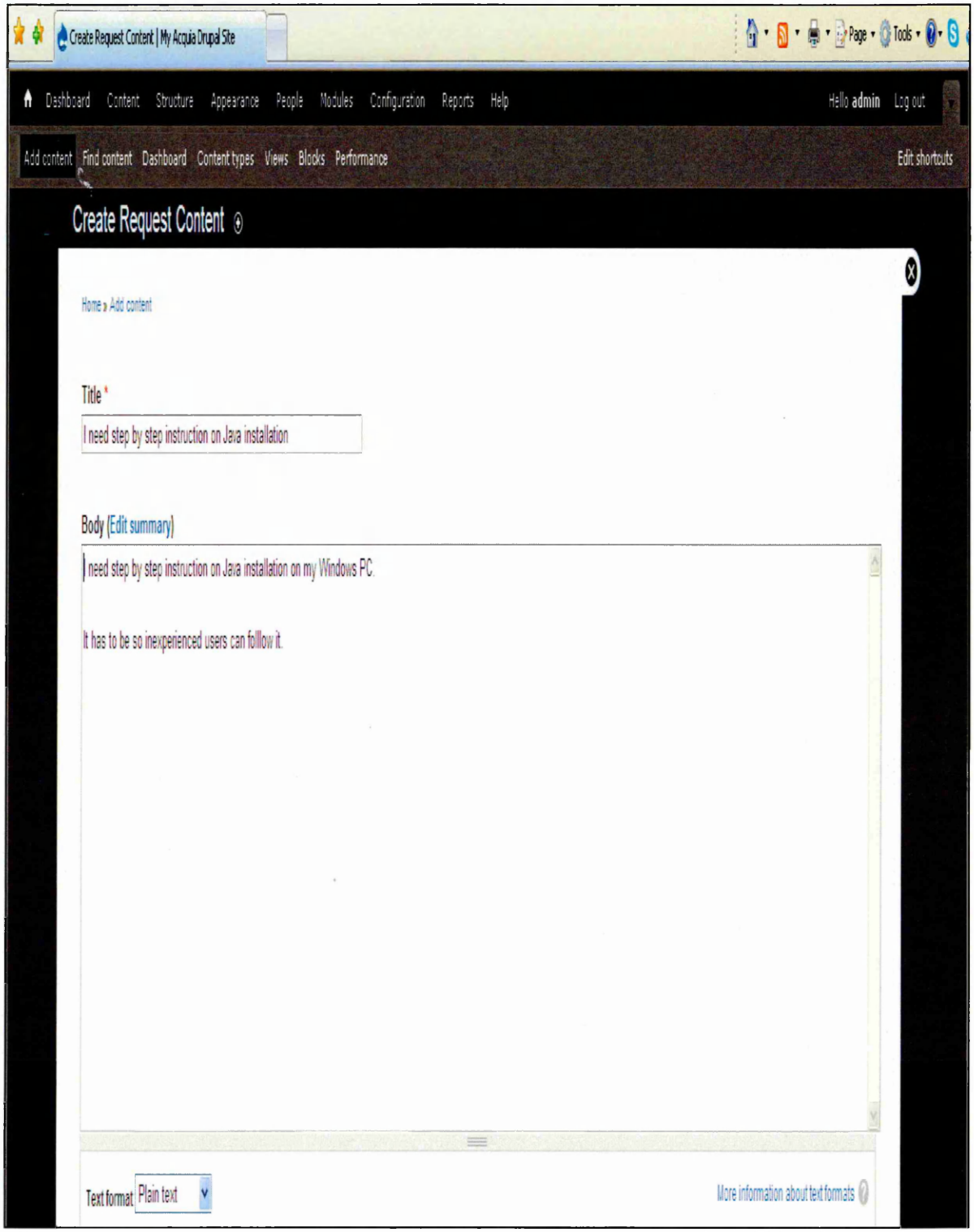
The Article and the Basic Page are default pages that are not used in Knowledge-Base Forum.

The request content form was designed as shown, where academic would insert the description of content.

The bidder form design:



An example of a complete form, this screen shot shows academic filling in a request for content and bidder content as shown in this example:

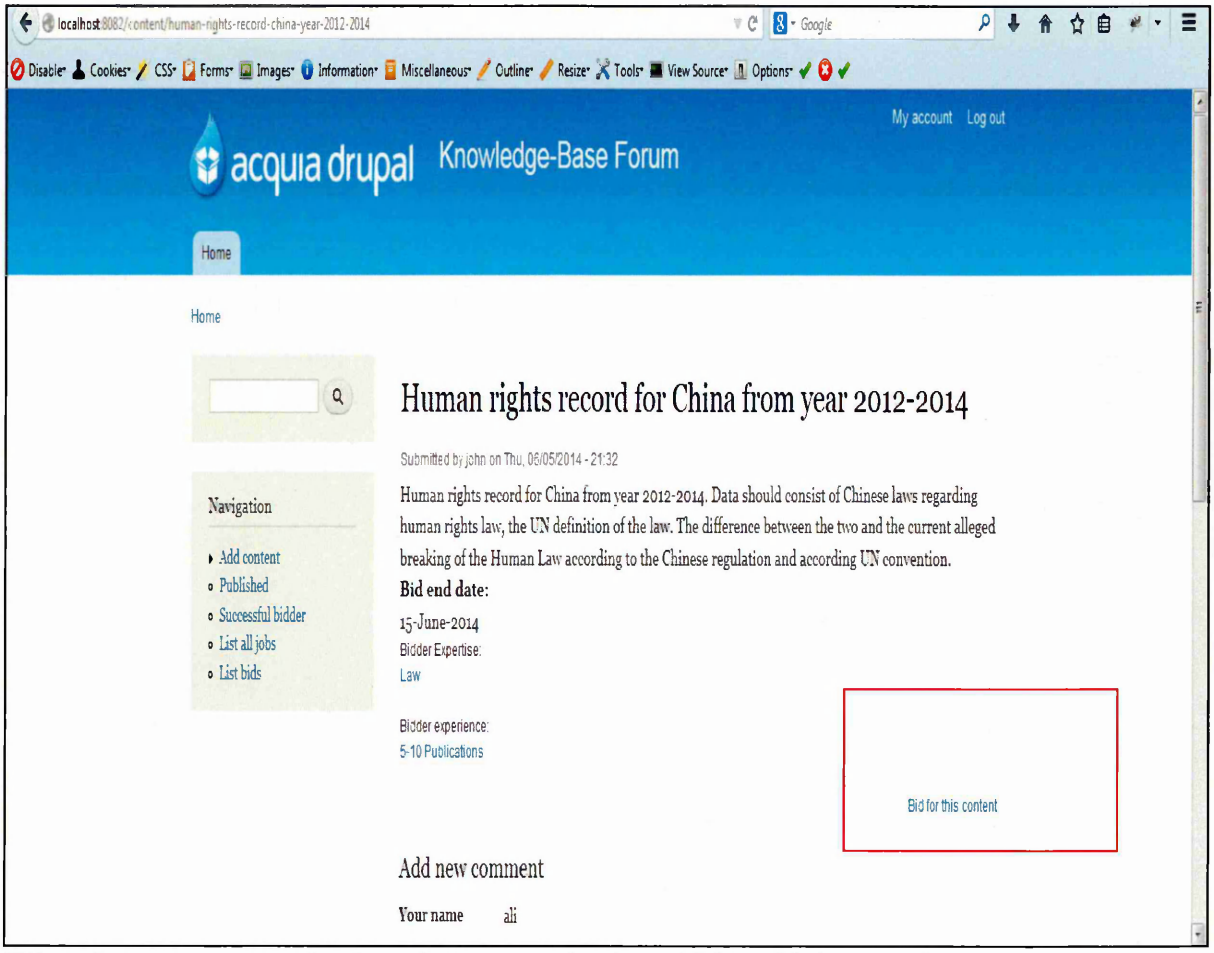


Configuration that links the forms together:

1. Flag

Flag allows dynamic and flexible bookmarking that marks specific content that can used as a Boolean operator, or to start an action. Flag is used in Knowledge-Base Forum to allow bidding to take place, when a bidder is ready to bid by clicking the 'bid' link which is a 'flag' link enabling the bid process to start.

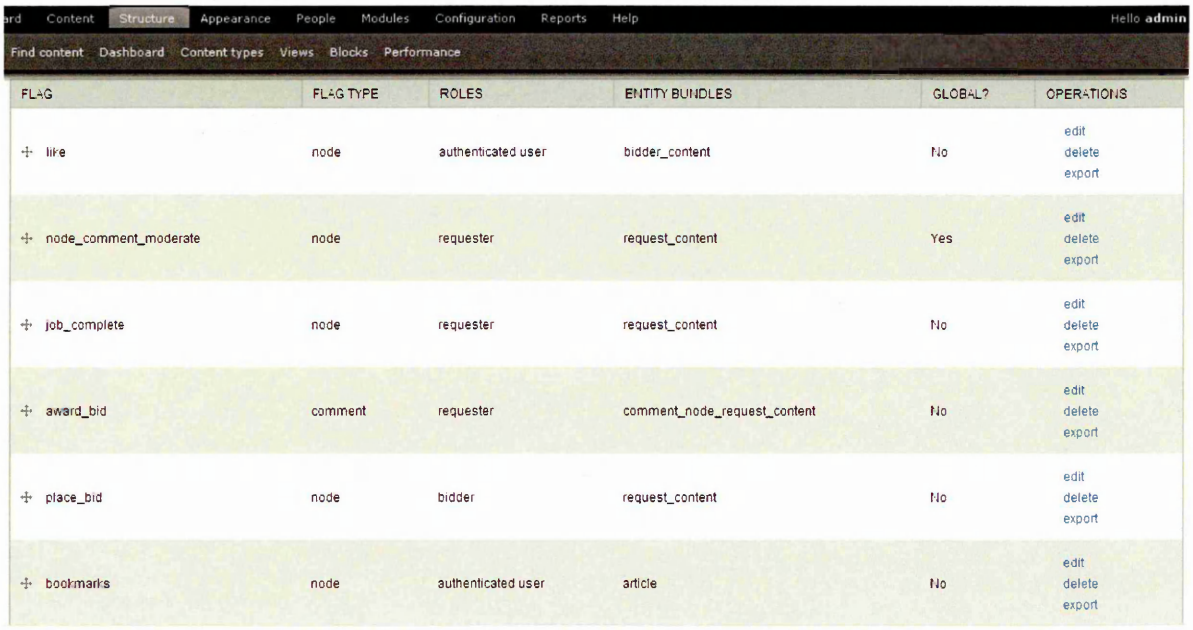
An example shows how flag is used in Knowledge-Base Forum, where academic request content, it creates a link on the page so that bidders are able to click on bid.



Other flags were required such as award, place bid and job complete.

The flag module screen shot shows the number of flags created and the configuration parameters were used.

Navigation path is > Structure > Flags



FLAG	FLAG TYPE	ROLES	ENTITY BUNDLES	GLOBAL?	OPERATIONS
like	node	authenticated user	bidder_content	No	edit delete export
node_comment_moderate	node	requester	request_content	Yes	edit delete export
job_complete	node	requester	request_content	No	edit delete export
award_bid	comment	requester	comment_node_request_content	No	edit delete export
place_bid	node	bidder	request_content	No	edit delete export
bookmarks	node	authenticated user	article	No	edit delete export

Flag configuration as follows:

COMMENT_MODERATE

Tick on Global flag

Flag link description: Enable comment moderation

Flagged messages: Comments will now have to be approved before being published

Unflag link text: Disable comment moderation

Unflag message: Comments will no longer have to be approved before being published

Role: requester

Flag access: FLAG , UNFLAG

Bundles: Request Content

Flag access by content authorship: No additional restrictions

Display Options: Display link on node page

Link type: JavaScript toggle

Tick on Add Drupal like

Add the text you want to display: (@count likes)

JOB_COMPLETE

Flag link text: Complete Job

Unflag link text: Completed

Role: requester

Flag access: FLAG , UNFLAG

Bundles: Request Content

Flag access by content authorship: Users may only flag content they own

Display Options: Display link on node page

Display link on node teaser

Link type: Normal link

Add the text you want to display: (@count)

AWARD_BID

Flag link text: Award bidder

Unflag link text: Unaward bidder

Role: requester

Flag access: FLAG , UNFLAG

Bundles: Request Content comment

Flag access by content authorship: Users may only flag comments by others

Display Options: Display link under comment

Link type: JavaScript toggle

Add the text you want to display: (@count)

PLACE_BID

Flag link text: Place a bid

Unflag link text: Remove bid

Role: bidder

Flag access: FLAG , UNFLAG

Unflag not allowed text: You already bidded

Bundles: Request Content

Flag access by content authorship: No additional restrictions

Display Options: Display link on node teaser

Display link on a node page

Link type: Normal link

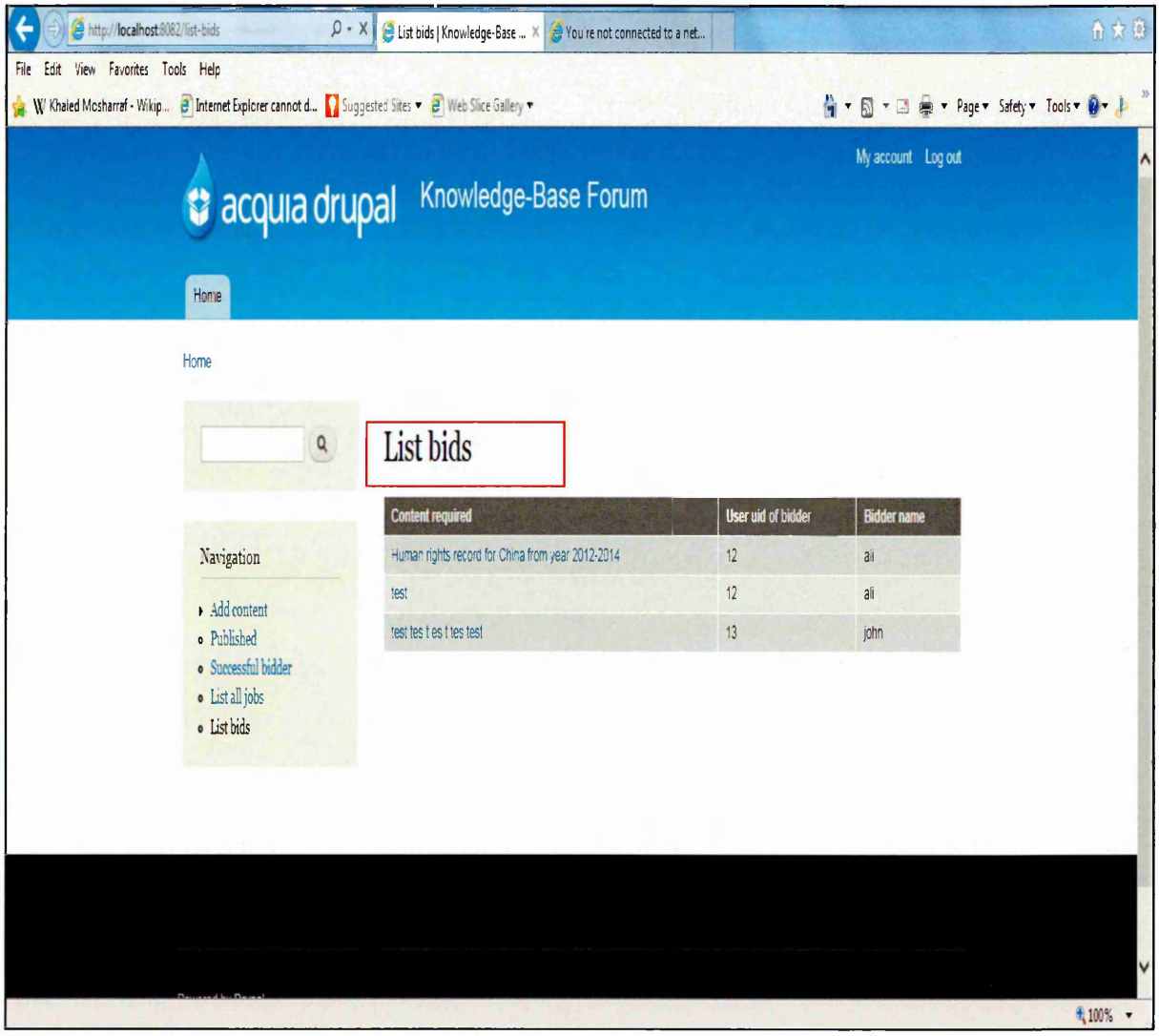
The flags link pages together and allow a trigger to occur to achieve a task such as bid or award a job. The next setting was the views, once the form was designed, the content either manually inserted, for example an academic inserting request for content which is stored in mySQL database, or a form that retrieves data from the stored tables such as views.

2. List of Views and parameter settings

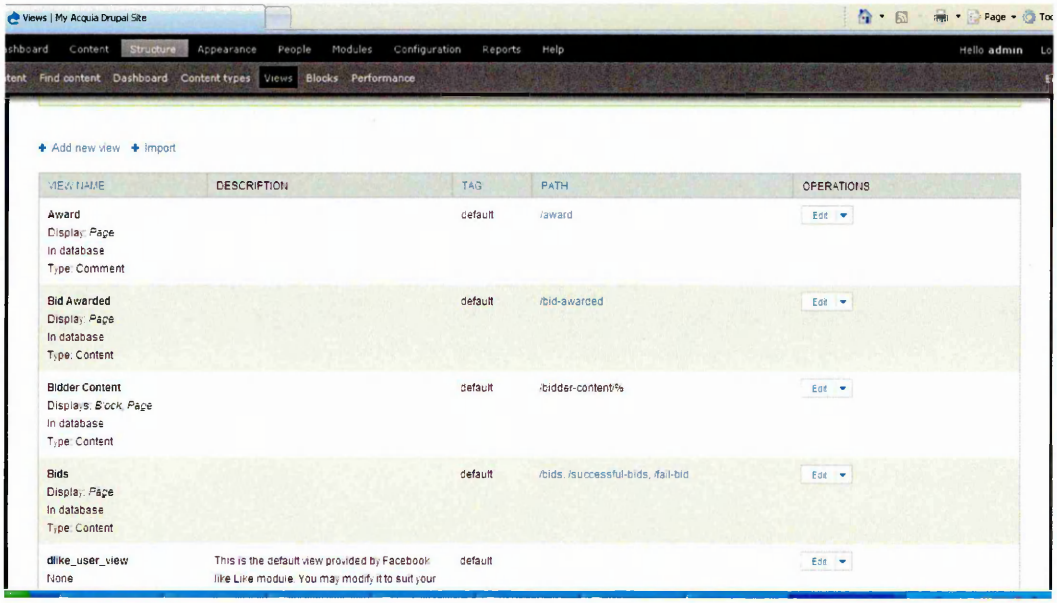
The views allow organizing and retrieval of Knowledge-Base Forum contributed content based on a specific requirement, or a list of content request made by academic can be held in a view. When academic submit content request it stores in a view, and when bidders contribute content the data is also held in a view, the view is stored in mySQL table, therefore it can be queried to display.

An example is, a view is created of all bidders made bids is stored on a view and when clicked List bids it shows all the bids.

The List bids page is a typical view that retries data from the action taken from bidders.



The below screenshot shows all the 'Views' that were created for Knowledge-Base Forum. It was configured by going to <Home> Structures > Views



Following are the created views and configuration parameters as follows:

LIST ALL JOBS view:

{This view lists all the jobs academic requested}

Content: Title (Title) (flag-bidder) Flags: User uid (User uid) (Bidder Name) User: Uid (Uid)

Filter criteria

Content: Published (Yes)

Sort criteria

Content: Post date (desc)

Menu: Normal: Bid Awarded to

BIDS view

{This view lists all the bids}

Fields

Content: Title (Title) (flag) Flags: User uid (User uid) (Flag user) User: Name (Name) Content: Author uid (Author uid)

Filter criteria

Content: Published (Yes) Content: Type (= Request Content) (complete flag) Flags: Flagged (False)

Sort criteria

Content: Post date (desc)

Menu: Normal: View All bids

SUCCESSFUL BID view

{This view lists all the bids that are successful}

Format: table

Fields

Content: Title (Title), (Content: Author uid (Author uid), (Comments) Comment: Author (Author)

Filter criteria

Content: Published (Yes) (flag) Flags: Flagged (exposed) (author) User: Roles (= bidder) (complete flag) Flags: Flagged (False) Content: Type (= Request Content)

Sort criteria

Content: Post date (desc)

Menu: Normal: Success-Fail

Fail Bids view

{This view lists all the failed bids}

Format: Table

Fields

(Comments) Comment: Comment (Comment)

(Comments) Comment: Title (Title)

Content: Title (Title)

Filter criteria

Content: Published (Yes) Content: Type (= Request Content) (flag) Flags: Flagged (False)

Sort Criteria

Content: Post date (desc)

Menu: No menu

Published Content View

{Once a complete job is verified by academic and the academic is satisfied the job is done successfully. The academic clicks the 'publish job' button, this content is held in this view that can be searched.}

Format: Table

Fields

Content: Title (Title) Content: Author uid (Author uid) (author) User: Name (Auther) (request) Content: Title (Title)

Filter criteria

Content: Published (Yes) Content: Type (= Bidder content) Content: Title (exposed)

Sort Criteria

Content: Post date (desc)

Menu: normal: Published content

LIST OF JOBS view

{This view list all the bidders}

Fields

Content: Title (author) User: Name (Author Name)

Filter criteria

Content: Published (Yes) Content: Type (= Request Content)

Sort criteria

Content: Post date (desc)

Menu: Normal: All Jobs

3. Taxonomy defined

Taxonomy is categories that are defined, so users who are requesting content can categories the request according to the requirement. This helps to classify content stored in Knowledge-Base Forum database. The requesting academic would have the taxonomy field visible so they choose the criterion, which is part of their requirement for a successful bid.

Following are the list of taxonomy that was created for Knowledge-Base Forum. It is designed for content requirement page. This allows the academic to specify conditions for a successful bid. Requesting academic must specify using taxonomy title and summary of the content required, experience, publications that a bidder must meet for a successful bid.

Academic requesting taxonomy terms created:

Taxonomy: - Title and Summary

Taxonomy: - Experience

Term: - 0-4 publications

Term: - 11-15 publications

Term: - 5-10 publications

The following taxonomy allows the academic to specify the field the post falls into:

Taxonomy: - Experts required in field

Term: - Literature and Arts

Term: - Engineering

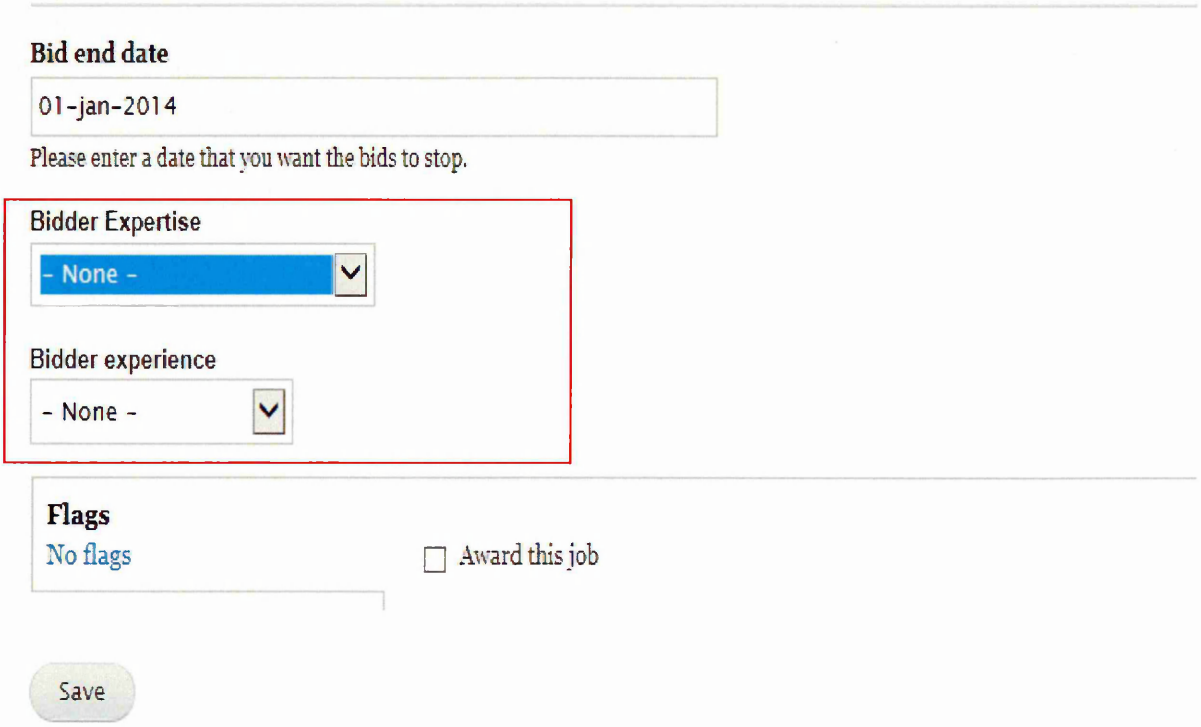
Term: - Health and Science

Term: - Languages - Term

Law - Term

Term: - Computing and technology – Term

A taxonomy example is the Bidder expertise and Bidder experience, when clicked it gives a list of options.



4. Setting permission for user rights:

The forms, views and flags all require privileges and links to users that are created for Knowledge-Base Forum to action. Three user roles were defined for Knowledge-Base Forum, the bidder, the requester and the administrator. The bidder views the list of jobs and can bid. The requester is the one who can submit content request and the administrator has all the access and permission. The permission and setting security setting allows configuration of Knowledge-Base Forum security, for the purposes of bidders and academic users enabling correct access, which user is able to write or view.

Following list shows the permission each role within the Knowledge-Base Forum. The administrator of Knowledge-Base Forum would access the following settings to enable the functionality that is required:

Permissions	Anononymous User	Administrator	Bidder	Requester
Block		✓		
Comment		✓		
Administer comments and comment settings		✓		
View comments		✓	✓	✓
Post comments		✓	✓	✓
Skip comment approval		✓	✓	✓
Edit own comments		✓		
Contextual links		✓		
Use contextual links		✓		
Use contextual links to perform actions related to elements on a page.		✓		
Dashboard		✓		
View the administrative dashboard		✓		
Customizing the dashboard requires the Administer blocks permission.		✓		
Drupal Like		✓		
Access list of users who flagged a content		✓	✓	✓
Facet API		✓		
Administer Facets		✓		
Filter		✓		
Administer text formats and filters		✓		
Use the Filtered HTML text format		✓		
Use the Full HTML text format		✓		
Use the PHP code text format		✓		
Fivestar		✓		
rate content		✓	✓	✓
Flag		✓		
Administer flags		✓		
Create and edit site-wide flags.		✓		
Use flag importer		✓		
Image		✓		
Create and modify styles for generating image modifications such as thumbnails.		✓		
Allow the user administer Lightbox2 settings		✓		
Download Original		✓		
Create a link that allow the user download the original image		✓		
Menu		✓		
Administer menus and menu items		✓		
Node		✓		
Bypass content access control		✓		
Administer content types		✓		
Administer content		✓		
Access the content overview page		✓		

View published content		✓	✓	✓
View own unpublished content		✓	✓	✓
View content revisions		✓		
Revert content revisions		✓		
Delete content revisions		✓		
Article: Create new content		✓		
Article: Edit own content		✓		
Article: Edit any content		✓		
Article: Delete own content		✓		
Article: Delete any content		✓		
Bidder content: Create new content		✓	✓	✓
Bidder content: Edit own content		✓	✓	✓
Bidder content: Edit any content		✓		
Bidder content: Delete own content		✓	✓	✓
Bidder content: Delete any content		✓		
Basic page: Create new content		✓		
Basic page: Edit own content		✓		
Basic page: Edit any content		✓		
Basic page: Delete own content		✓		
Basic page: Delete any content		✓		

Basic page: Create new content		✓		
Basic page: Edit own content		✓		
Basic page: Edit any content		✓		
Basic page: Delete own content		✓		
Basic page: Delete any content		✓		
Request Content: Create new content		✓		✓
Request Content: Edit own content		✓		✓
Request Content: Edit any content		✓		
Request Content: Delete own content		✓		✓
Request Content: Delete any content		✓		
Overlay		✓		
Access the administrative overlay		✓		
View administrative pages in the overlay.		✓		
PHP filter		✓		
Use PHP for settings		✓		
Path		✓		
Administer URL aliases		✓		
Create and edit URL aliases		✓		
Pathauto		✓		
Administer pathauto		✓		
Allows a user to configure patterns for				

Edit and view all user profiles.		✓		
Requester: Edit own profile		✓		✓
Requester: Edit any profile		✓		
Requester: View own profile		✓	✓	✓
Requester: View any profile		✓	✓	✓
Bidder: Edit own profile		✓	✓	
Bidder: Edit any profile		✓		
Bidder: View own profile		✓	✓	
Bidder: View any profile		✓	✓	
Profile2 Registration Path		✓		
Administer Profile2 registration paths		✓		
Enable and configure unique registration paths per Profile2 profile type.		✓		
Redirect		✓		
Administer URL redirections		✓		
Rules		✓		
Administer rule configurations		✓		
Bypass Rules access control		✓		
Search		✓		
Administer search		✓		
Use search		✓		
System		✓		
Administer modules		✓		
Administer site configuration		✓		
Administer themes		✓		
Administer software updates		✓		
Use the administration pages and help		✓		
Use the site in maintenance mode		✓		
View the administration theme		✓		
View site reports		✓		
Block IP addresses		✓		
Taxonomy		✓		
Administer vocabularies and terms		✓		
Edit terms in Field of expertise required		✓		
Delete terms from Field of expertise required		✓		
Edit terms in Published Works		✓		
Delete terms from Published Works		✓		
Edit terms in Summary		✓		
Delete terms from Summary		✓		
Edit terms in Tags		✓		
Delete terms from Tags		✓		
Toolbar		✓		